

103
**INDIGENOUS PEOPLES AND THE NATURAL
ENVIRONMENT OF BRAZIL**

Y 4.F 76/1:B 73/3

Indigenous Peoples and the Natural...

HEARING
BEFORE THE
SUBCOMMITTEE ON
THE WESTERN HEMISPHERE
OF THE
COMMITTEE ON FOREIGN AFFAIRS
HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRD CONGRESS

SECOND SESSION

MAY 10, 1994

Printed for the use of the Committee on Foreign Affairs

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INDIGENOUS PEOPLES AND THE NATURAL ENVIRONMENT OF BRAZIL

TUESDAY, MAY 10, 1994

HOUSE OF REPRESENTATIVES,
COMMITTEE ON FOREIGN AFFAIRS,
SUBCOMMITTEE ON THE WESTERN HEMISPHERE,
Washington, DC.

The subcommittee met, pursuant to call, at 1 p.m. in room 2172, Rayburn House Office Building, Hon. Robert G. Torricelli (chairman of the subcommittee) presiding.

Mr. TORRICELLI. The subcommittee will please come to order.

Last August, on the occasion of the massacre of Yanomami Indians by gold miners, it was written in Brazil that what happened in the United States during the gold rush has now been repeated, without the escapades of General Custer, here in Brazil.

This parallel speaks to a primary purpose of today's hearing. The slaughter of indigenous peoples in the United States is one of the most shameful chapters of our history, but it is one that we cannot forget. Indeed, one of the best ways to make amends with this unfortunate chapter of U.S. history is to address the fact that even today, in other lands, indigenous peoples face the same abuses by government policy.

In Brazil, the survival of 200 societies of indigenous peoples is now at issue. For most of these societies, their survival and their capability to maintain their cultural integrity is intimately connected with their control of their natural resources. Those resources are being sought aggressively and often violently by mining and other interests, many of whom stop at nothing, including murder, to gain access to indigenous lands.

Last year, 16 Yanomami tribesmen were murdered in cold blood because wildcat miners wanted the gold under their land. The Guaraní, after seeing their territory drastically reduced and their attempts at preserving their constitutionally guaranteed right to own land negated by courts, are committing suicide in great numbers. These and other indigenous groups ask nothing from the government other than the right to remain on their traditional lands. Because of the material value of those lands, their requests are being denied.

This is a tragedy not only from a human rights perspective but also from an environmental perspective. Already, as we can see from the satellite photographs in this room, the amount of deforestation that has taken place in the Amazon is devastating. What we cannot see are some of the other horrible environmental consequences of this exploitation, such as the spread of large quan-

tities of highly toxic mercury to the Amazon, a result of uncontrolled mining.

We have called together representatives from the Clinton administration, leaders of two Brazilian indigenous nations and Brazilian Presidential candidate da Silva to discuss ways in which the Brazilian Government can best protect their indigenous peoples and the Amazon and ways in which the United States can be of assistance. We will also hear from several prominent members of our scientific community who will discuss ecological impacts.

There are several important messages that we can send today to the Government of Brazil with this hearing. The first is that judicial impunity for the perpetrators of violence, especially in land conflicts, creates a climate where law enforcement becomes impossible. If the judicial system cannot protect the most basic human rights, no real development can occur. The United States must find means to support appropriate Brazilian initiatives for judicial reform.

We must also convince Brazil to consider protection of its tropical forests as a more appropriate and lucrative policy than destruction of those forests. The biodiversity of the Amazon may well contain information and material critical to new generations of products in the fields of biotechnology and genetic engineering, with an inestimable value to the planet. Protection of biological diversity and its appropriate use can become a source of enormous wealth for Brazil.

The Clinton administration believes that economic growth and development can and should be compatible with environmental protection, as well as with the defense of human rights. I hope that they will heed the discussion of these issues here today as they proceed in preparing for the Summit of the Americas to be held in Miami.

It is also our intention to use this hearing as an opportunity to promote specific legislation. The American market for timber products has stimulated deforestation. I believe that making American consumers aware of where these timber products come from and the deforestation that they produce is an important part of our contribution to protecting the Amazon.

Once again, I welcome our distinguished visitors here today from Brazil and our American guests, and we look forward to your testimony.

[The prepared statement of Mr. Torricelli appears in the appendix.]

Mr. TORRICELLI. Mr. Smith.

Mr. SMITH. Thank you very much, Mr. Chairman.

Mr. Chairman, our subcommittee has begun to examine the array of issues pertaining to indigenous people, especially in Brazil. Last July, we heard testimony from a combination of Brazilian and U.S. witnesses, and today's hearing will expand on the issues which persist.

Year after year, Mr. Chairman, the reports of human rights abuses are filed and sometimes the reports garner international coverage. Incidents which occur in remote areas of a country are difficult to investigate, and it seems that whether the incidents are

widely reported or quietly uncovered, justice is not diligently pursued by legal and political authorities.

About the time of our last hearing regarding indigenous peoples in Brazil, five Yanomami were murdered by Brazilian miners; the Yanomami revenged, killing two miners. The retaliation came in the chilling murders of 16 Yanomami that you mentioned, Mr. Chairman, living near the Brazilian-Venezuelan border. The dead were mostly women, teenagers and children. Two gold miners that were charged with the murders have been released.

Throughout the country, more than 40 Indians were killed last year. And if Brazil's record is a guide, the murderers will remain free with impunity.

Mr. Chairman, we awaited the October deadline for the demarcation of lands for the indigenous peoples. The 1988 constitution allowed the government 5 years to demarcate lands designated for Brazil's Indian population. The deadline arrived last fall, and only about half of the 519 areas had been legally demarcated and titles issued. This is but one more example indicating that the political will to fulfill the promises and legal obligations designed to protect the indigenous population seem to be absent.

Let me also note, Mr. Chairman, that we have invited, as you well know, one of the leading candidates for the presidency in Brazil, but I would like to make it very clear that, while he will be here making his presentation, we are in no way endorsing any candidate in the field in Brazil. As a matter of fact, those other candidates who would like to make presentations, obviously, would be very much welcomed by this subcommittee to make their presentations.

I look forward to the testimony from all of those involved, and I yield back the balance of my time.

Mr. TORRICELLI. Thank you very much, Mr. Smith. Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I certainly would like to commend you for your initiative and for your leadership in taking it upon yourself to call not only the hearing we are now about to have today but certainly the ones in the past.

I have always taken a personal interest in matters affecting indigenous people, especially those living in the Republic of Brazil, and I certainly want to commend you for your efforts in bringing to light some of the problems affecting the rights of those people living in Brazil.

I have always taken an interest, also, in human rights violations, and I would be very interested to learn from the administration as to how we are applying this policy of human rights. If we are doing this against China, are we also doing this on an equal basis in other countries that we are aware of that have human rights problems? I am very curious to learn from Mr. Shattuck and other members of the administration who will be testifying this afternoon.

I certainly would like to offer my personal welcome to Mr. Lula, who is one of the Presidential candidates for the presidency of Brazil. And, reiterating again what Mr. Smith had said earlier, this is not an endorsement in any way of our affiliation with the politics as it rightly belongs to the people of Brazil.

But I certainly look forward to hearing from our witnesses this afternoon. Thank you, Mr. Chairman.

Mr. TORRICELLI. Thank you very much. Mr. Ballenger.

Mr. BALLENGER. Thank you, Mr. Chairman. I have just a short statement.

I was lucky enough to fly over the Amazon basin of Brazil at night several years ago, and it was unbelievable that we could see the fires that were being set. Now, whether it was over the Yanomami Indian area, I do not know, but, to see the innumerable fires that were being built to clear the land for either farming or mining makes you wonder about the oxygen supply for the world. So I am very happy to hear the witnesses today and look forward to their information. Thank you, sir.

Mr. TORRICELLI. Thank you very much.

The subcommittee will now hear from Mr. Luiz Inacio Lula da Silva, president of the Worker's Party and a Presidential candidate of the nation of Brazil. Mr. Lula, welcome to the subcommittee. We welcome you to the subcommittee.

It is unusual to have a candidate seeking the Presidency of another nation to appear before the Foreign Affairs Committee. In large measure, our desire to be with you today is a reflection of personal admiration and the belief by many in this country that you have come to symbolize the hope and the aspirations of the workers of your country for a better life, and the international ambition to protect the extraordinary resources of your nation and the vulnerable indigenous people who live within them. And so we welcome you to the subcommittee today.

I want to express my thanks to representatives of the Clinton administration for taking the unusual step of agreeing to appear after Mr. Lula's presentation. If it is unusual to have a foreign leader appear, it is particularly unusual to have them appear second. Since you are having less political difficulties at the moment than the Clinton administration, we thought it was appropriate. Welcome to the subcommittee, and we welcome your testimony.

STATEMENT OF LUIZ INACIO LULA DA SILVA, PRESIDENT OF THE WORKER'S PARTY, FORMER CONGRESSMAN AND PRESIDENTIAL CANDIDATE

Mr. LULA DA SILVA. [As translated.] In the first place, I would like to thank very much the members of the subcommittee for inviting the Worker's Party for this debate, especially to Chairman Torricelli for his kind and gentle words in reference to my person and the concern that he has with the problems in Brazil.

I would like to start saying, first, we are going through a very important moment in the political life in Brazil. On October 3, we will have general elections in the country for President, governor, et cetera. Whoever is elected in the Presidential campaign elections in 1994, he will have to administer a country that is facing a lot of problems, like the many problems that many other Latin American countries also face.

We have four main concerns: the issue of unemployment in our country, the hunger issue that involves millions of people in the country, the educational problem, and the health issue. Altogether, these problems cannot wait any more for a solution for them.

And it is exactly due—having these problems in mind, that the new President will have to face to recover not only the investments in our country but to make our country grow once again, generate new jobs, distribute income, and generate the possibilities that people can concur their citizenship. Within this logic, we intend not only to maintain international ties that it already has, but we will try to improve them and make them even better.

But, at the same time, we plan to open new, broader lines in the international scenario with the African countries, China, India, and even increase more and more our relations with Latin America. Only with the good international relations policy or foreign policy and in having a lot of courage that we can create the conditions together with other countries, draw the attention of the rich economies for the need to have the discussion for a new economic order so that 80 percent of mankind that only consumes 20 percent of all of the richness and wealth that is produced could have more equity, fairer participation in the wealth that is produced in our planet.

We also would like to register here with the concern that we have the kind of development model we want for Brazil, a development model that takes into consideration the need for more industrialization of our country, that we should have development in the Amazon region, making compatible development and, at the same time, preserving the environment in the Amazon region.

Our party in 1982 voted, while discussing the drafting of a new constitution, in favor of the demarcation of the indigenous people's land. And this is a commitment that we have, not only with our brothers and sisters of the indigenous people, but also with our consciousness, because the indigenous people lived in our land before we got there. That is why they have the right to land to survive.

Nevertheless, it is very important to have in this process a demarcation of the indigenous people land and the respect for their culture and also for the respect of the autonomy of the indigenous people nations, but we should not have the delusion that our country will not permit that we lose our sovereignty in that region.

Yes, what we want is try to seek the partnership to help to develop a region that is not fully inhabited and to guarantee the right of citizenship to 18 million people that live in that region and also to guarantee the right of citizenship to the 250,000 indigenous people that live in Brazil.

We don't want in any way to pay homage to the Brazilian indigenous people by transforming them just like a piece of an object of a museum. We want the indigenous people alive, practicing their religion, practicing their culture, growing as a nation, as an indigenous nation, and surviving at the expense of their own work, of their own scientific knowledge that they have. Only in this way will he become a free citizen, autonomous and a citizen capable on deciding about his own fate.

We are fully convinced that the retroprocess in Brazil brings high hopes for other economies in Latin America. After all, after a long period of military regimes, democracy starts to flourish and consolidate itself. And the grassroots organizations, the labor movement and the political parties will consolidate their spaces.

And we, that already conquered the institutional democracy, now we have to conquer the economic democracy. This is our commitment in relation to the Brazilian people.

So now we can open for debate with the subcommittee members.

Mr. TORRICELLI. Thank you very much. Thank you for your statement.

[The prepared statement of Mr. Lula da Silva appears in the appendix.]

Mr. TORRICELLI. The extraordinary claim has been made by some within the Brazilian political establishment that the international effort to protect the Amazon is driven by either a desire to keep the people of Brazil poor or because of territorial ambitions by other nations, including the United States. This entire argument is so extraordinary and without foundation that most Americans would react in disbelief.

There is no more American desire to protect the Amazon than there is to preserve the Everglades, the rain forests of Central America or those of Indonesia or China. They are based on the same motivation, that we are risking global economic catastrophe if measures are not taken to protect these last remaining forests. The only difference with Brazil is that, because of its size, it is more important.

This extraordinary meeting that we are having today between our subcommittee and a representative of your party that you are leading in a great struggle is a chance to set this record straight. We may differ on the means or the timing or the finance, but that I hope we can agree that the international desire to save these rain forests is a legitimate concern of all people toward all of these lands, and that the false banner of nationalism has no application in this expression of concern.

We all recognize legitimate national sovereignty. No one questions Brazilian claims to every square mile of the Amazon and its resources and its peoples, but that all peoples, not only in rain forests but in all delicate, important, and threatened environmental regions of the world have a right to speak to their preservation.

I hope we can use this opportunity to set the record straight and establish the legitimacy of these concerns in the context of recognizing the legitimacy without question of Brazilian sovereignty.

Mr. LULA DA SILVA. [As translated.] The Brazilian Government, from what we have been following from the press, has a lot of concern to preserve the Amazon region. We in the Worker's Party—and now I am speaking on behalf of my party—not only do we have interests in preserving the Amazon region, but we have a specific project for the Amazon region that all the delegates that attended the national convention of the party received.

And also there was this—this specific project also delivered to all of those participants during the Earth Summit in 1992 in Brazil. This is a project that takes into consideration the area for cattle breeding, which area you can have some agricultural plantation, areas for fishing, areas that you can start reforestation.

So it is with this objective that we want to discuss at the international level the rain forests region. We cannot accept the idea that only—that this is something that belongs. It is a mark of mankind, that we have to take into consideration that this landmark

has to also take into account the 18 million people that live there and that need to find a job, work, and have the right to have access to modern life.

What we have to take into consideration is that the development model for the rain forest region cannot be the Detroit development model or the New York development model. We have to create a development model that will be adequate for the rain forest region, trying to extract—trying to explore but not devastate the potentiality that exists and that could bring benefit for the people that live in the Amazon region.

So within this aspect we are at your disposal to have a conversation with all institutes, with all governments, to help, not only to preserve or conserve the rain forests but also to have less pollution in the planet Earth. This is a policy that we want to emphasize and we want people from other countries to know our policy.

The only thing we have of more in-depth divergence is when some say that the rain forest region is the lung of the world, I answer to that, replying and saying that pneumonia is our foreign debt that is attacking that lung.

So it is necessary that we should have a more in-depth discussion, a very serious discussion, and this is the kind of discussion that our party intends to promote in all of the international forums.

Mr. TORRICELLI. The challenge in your remarks is unmistakable, indeed, if the world is to recognize the Amazon as the lung of the world, then the world has to be prepared to bear part of the costs for maintaining it in good health.

As a future President of Brazil, if you challenge the international community to ease the burden of debt in order to ease the pressure on environmental destruction, it would be to the great shame of the international community if, because of their own inherent interests, they did not respond to that challenge.

What I would hope can be avoided in the Brazilian political context is the false choice between economic development, the interest of those who want, and environmental protection for everybody else. That is no choice at all.

And we speak about this as Americans not because we have done this right in our own history but because we have done it wrong, and generations of Americans are now paying the price. Because we believed that there was economic development in the destruction of lands, and that in the destruction of native cultures there was a political accommodation and an economic benefit. We have learned all of those prices. And we simply make these suggestions to you so that you avoid both the cultural, political and, indeed, the economic costs of doing it wrong.

I have seen with my own eyes the largest scars on the face of the earth of hydroelectric facilities that have absorbed thousands of square miles of the Amazon, displaced people, lost habitats, to produce an economic asset which cannot possibly function for more than a few years and cannot possibly be economically of value. They are the greatest example I know on the face of the earth that environmental protection and economic development not only are not incompatible, they indeed are compatible and may be a necessity.

I know that in your voice, from your experience, you can and will offer this to the Brazilian political context. And that is why you are so important, not simply for the people of Brazil but indeed the entire international community.

Your challenge here today has been unmistakable, that in any administration you may lead in the future, there is an obligation by Europeans, American, Asian nations as well, to respond to the debt crisis to deal with the ecological destruction. I hope you make that challenge unmistakable, that it is clear how, when and where we need to respond.

Mr. Smith.

Mr. SMITH. Thank you very much, Mr. Chairman.

Mr. Lula, thank you for your testimony. Earlier at lunch you had invited comment on the Worker's Party platform, and I read through it with some depth. I have a number of concerns about which I would ask you to shed some light.

Many of us on the subcommittee, and I think many of our citizens, would like to know exactly where your administration would take Brazil. To begin, I will focus on two issues which probably are the most divisive in this country and perhaps in other countries. I speak of the abortion issue and the issue of homosexual marriages.

The platform that you have tendered us speaks of the right to abortion. You make the point that abortions—that the challenge, the word your party uses in its platform, is to formulate proposals that are capable of safeguarding the right to abortion. In what direction would you take Brazil on those two questions, the right to homosexual marriages and the right to abortion.

Parenthetically, I would say that, from this particular member's point of view, the most elemental, the most fundamental of all human rights is the right to live. And I believe very strongly that birth ought to be seen as an event that happens to all of us. It is not the beginning of life.

If we backtrack in the life of that unborn child moment by moment, the only thing that is being added from the time of his or her conception is growth and maturity. Nothing new is ever added after that point.

I raise this issue because there are some 95 to 100 countries, including your own, that protect the lives of their unborn children. I think, and you know, it is important that a large, sovereign and great country like Brazil, which has shown itself capable of the politics of inclusion, of including those unborn baby boys and baby girls, should not veer off of that course.

I had the honor and the privilege a few years ago of delivering the statement for the United States of America at the United Nations on the Convention on the Rights of the Child. And, part of that statement recognized that any definition of human rights must be inclusive rather than exclusive of those tiny children who otherwise might be sacrificed in the womb.

So assuming, perhaps, if you are the President, would there be in the offing a weakening of those abortion laws and, again, how would you change the issue of the homosexual marriages?

Mr. LULA DA SILVA. [As translated.] Before I approach the issue of abortion, I would like to say to the chairman of the subcommit-

tee that, for us, from the Worker's Party and for a great part of the intelligentsia in Brazil and of all of the citizens that have a good sense in Brazil, the Balbina hydroelectric project could be considered a monument of insanity in our country. Because never in our history was such a devastating effect happening and never so much money was spent to produce not very much.

Unfortunately, that hydroelectric plant is already built, and now we have to put it to work, even though it doesn't serve the needs of energy supply for that region. I hope that never more in the history of our country someone builds a monument to insanity like the Balbina hydroelectric project.

Mr. TORRICELLI. If Mr. Smith would just yield for a moment, if I hear nothing else during your entire visit to America, it all would have been worthwhile for that single statement. There has already been massive destruction, but with up to 30 more hydroelectric plants planned for the Amazon, Brazil having the leadership to avoid that level of environmental destruction is one of the most critical issues that I could identify.

It isn't a question that the environment—the Amazon was destroyed so that a developing nation would get electric power and get economic benefit. It is the destruction of thousands of square miles of the Amazon to produce reservoirs that are not going to produce electric power and then leave Brazil saddled with massive debts for a program that didn't work. It is the biggest lose-lose-lose proposition that I have ever seen. And your words offer enormous encouragement.

Thank you, Mr. Smith, for yielding.

Mr. SMITH. Mr. Lula.

Mr. LULA DA SILVA. [As translated.] I think that it wasn't a lose-lose situation. I think it was a win-win, because certainly some contracting companies won.

In relation to the abortion issue, I am going to start out with a statement that I made in the national convention of my party. I am personally, and I think that any citizen that has some wisdom, will be against abortion. I think that even the women that practice abortion are against abortion.

But what my party can't do is that we can't afford not to discuss such a relevant issue in a country where the estimates vary from 2 million to 4 million abortion cases per year. So what we want is—in the first place, we want a regulation of the abortion that is already foreseen by law, as in the cases of rape or any risk of life for the mother.

And, in the second place, that the state should deal with this as a national public health care problem for those persons that are going through abortion process, because that same state of government that doesn't have any condition to establish any kind of family planning policy or any educational policy will have not much moral authority to penalize someone that practices abortion.

In the program or platform of our party, we don't defend abortion. There is also defense to the right of life. What we really want is that in the concrete cases we state your government should assume its responsibility and leave the thousands and thousands of women who may die.

Our program was approved not only by persons that belong to the party, but a series of Catholics and a number of Evangelicals and many Pentecostal members.

Another important thing that I would like to state is that we don't defend the marriage of homosexuals. In Brazil, our youth, they don't even want to marry men with women, so if marriage is not between men and women, it is useless to defend the marriage of homosexuals.

What we want to accomplish as a political party is not that we should not use hypocrisy. We know that this exists, that it exists—there are millions of homosexuals in Brazil. And what we want is these people should have the right to life, and they should—they are the ones that decide their way of living. And it is not the state or the government that should determine how these people should relate one with the other.

This is what is guaranteed in our platform, and that is why we are going to have some struggle on this issue.

Mr. SMITH. Just so I am very clear on that point, would that also apply to adoption? Would homosexual people who are married be able to adopt children?

Mr. LULA DA SILVA. [As translated.] No. What we left clear in our platform is that the homosexual should have access to the social security, public social security that we have in Brazil.

Mr. SMITH. And one other point of clarification. In using the public health services and the hospitals of the country for abortion, would that be only in the case of rape, incest and life of the mother as you have indicated or—as the platform seems to indicate—is it a weakening of reasons why abortion would be contemplated?

Mr. LULA DA SILVA. [As translated.] As Brazilians state, we do not adopt an educational policy and a planning policy that could educate people to plan when they want to have a child, that we can try to educate people that they can have sexual intercourse without having children. And for this we want to use the public school system, the media, radio, TV and all the possible means and places where we can have this educational program.

Because a country that has 32 million people below the poverty line, where 18 percent of the population is illiterate, it is very difficult for you to want to punish someone before giving a chance to that person a choice if they wanted to have a baby or not.

So besides taking care of that what is foreseen by our laws, we also want that the state should take care of the almost 2 million women that are victims of the abortion voluntarily or nonvoluntarily. But the state has to participate in an educational process on this issue. It is the only way for us to have family planning and people decide by themselves how many children they want to have.

Mr. TORRICELLI. Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman.

As you are well aware, Mr. Lula, Brazil is not the only country that has problems with its indigenous Indians, especially relevant to our own country here in America. Just recently, our President held a summit meeting with some 300 tribal representatives from all over the United States at the White House. And I am sure the

same occasion is also quite true with other countries in Latin America, Mexico and even Canada.

Now, while I really admire your commitment and courage to say that you will provide all of the necessary assistance dealing with indigenous Indians in Brazil, I am just curious how you will go about accomplishing such a task.

Let me just share with you my own perspective of what we have had to do in our dealings with the Native Americans here in our country.

Our first policy toward the indigenous Indians here in our country was to kill them. Then, after that, we thought, well, let's assimilate them, make them part of America. Then, after that, say let's terminate them. No more recognition of their tribal sovereignties as separate tribes.

Now, our latest policy is, let's restore the tribes, give them some sense of sovereignty, but give them all the four areas that you have indicated earlier, about education, health and all this. The sad part about this is we are still having very serious problems in dealing with our own indigenous people here.

And I wanted to ask you if you might have that magic formula that will assist us, after 500 years of literally committing abuses toward the indigenous people not only in this country but as well as in Brazil and throughout Latin America, as well as in Canada, if you just might have that magic formula that will resolve some of these problems.

And I wanted to know if you could elaborate a little further on how we will go about in assisting 1.5 million Indians in Brazil versus some 148.5 million people there in your country.

Mr. LULA DA SILVA. [As interpreted.] There is no magic formula. I think that the magic will make possible that worker's party government can deal with dignity, the indigenous people issue. The indigenous people is not an abstraction or something that is mere fiction that I just see once in a while. Our party has a lot of the ties and relationships with the indigenous peoples.

Many indigenous peoples communities have candidates and are members of our party. My relationship with them is not for the electoral process. It is almost ideological kind of relationship that we have. It is not a commitment of just having now because I am a candidate for the Presidency. It is a commitment that we have for a long time in our program in the party. My party was just born in 1980, I am not going to be acquainted or have a first meeting with the indigenous people in the palace when I become President.

I already had many meetings with them before that. So for me to serve the needs of the indigenous people as a citizen, is the same thing to serve the needs of other segments of our society that were born together with me during my time.

So I don't have any kind of problem to say here in this subcommittee that for us the miracle, what we call miracle is political will and is to have determination. We should comply and put in practice words and our speech in favor of our brothers and sisters, and put our words into practice.

So we have no problem in saying here that our national Congress or even in the American Congress, what was already approved by our Constitution, the demarcation of the indigenous people lands.

Now, the role of the President is to have the courage to implement and enforce what is written in the Constitution to demarcate the lands, and create the conditions so that the indigenous people could live with dignity. So that is why I am convinced that it is not an easy task to perform.

Mr. FALCOMA. I realize—and I thank you for your statement. This always seems to be an issue when I talk to some of the leaders in South America, it is one of those issues that they don't want to talk about very much. And I think a classic example of what has happened in Chiapas in Mexico speaks to that.

In your leadership capacity when you do become President, or when the people vote you accordingly, that perhaps you might want to initiate a summit of the whole Western Hemisphere to take up this issue of the rights of indigenous peoples because it is not just in Brazil that this problem occurs, it was throughout the Western Hemispheric countries, and I wonder if you might take up that concern when you become a leader in your country in that respect.

Mr. LULA DA SILVA. [As interpreted.] I am being very cautious and careful about assuming certain commitments in advance. The first place, I must remember that I have to win the election. And the second place, I have to have the inauguration. Then I can start to think if I can call for a summit meeting. The only thing that I consider is that we should have some kind of understanding that this struggle is to preserve the environment, this struggle against devastation, preserving the indigenous people, it is a cultural struggle that our party assumes. And that is why it is going to be much more easier to put it into practice, because the indigenous people will not be the only ones that demand this of us.

The exacting national board of my party will be demanding for my part. The labor movement will put pressure, and certainly the national convention of my party will also demand of me.

Mr. FALCOMA. Thank you, Mr. Chairman.

Mr. TORRICELLI. Mr. Ballenger.

Mr. BALLENGER. Thank you, Mr. Chairman. And we thank you kindly for being here, Mr. da Silva. In reading your party's platform, it makes the statement that it shifts attention from production to the redistribution of wealth.

One of the things you mentioned in your statement about a major problem in Brazil today was the unemployment problem. Recognizing that in other countries that have tried redistribution of wealth, it doesn't necessarily create new jobs, in fact it has a tendency to reduce jobs. I fully recognize the problem that existed when I was in Sao Paulo and that everybody in Brazil wanted to go to Sao Paulo because that is where the jobs were while the explosive population growth there just continued on and on. I think at the time, there were tax advantages to not develop plants or industries in the State of Sao Paulo, but put them elsewhere.

What other ideas do you have for creating new industry when redistribution of the wealth is one of your major factors?

Mr. LULA DA SILVA. [As interpreted.] It is very important to remember that I also, myself, come from the Northeast; that I came by truck 2,800 kilometers to reach Sao Paulo, because in those days industrialists from Sao Paulo, they were convinced that they should publicize the job opportunities that Sao Paulo offered. If

someone were screaming in the streets that there is a job opportunity in Sao Paulo, it would be the same thing as if someone shouted out we discovered gold in some place in the United States. There would be a rush, because everybody wants to improve their living conditions.

And I believe that this kind of development model has reached its extent. Exhausted. We cannot continue to experience an explosion of population. We have overpopulation. The problems derived from this, transportation problems, health problems, traffic jams, urban violence, criminality increasing, and many other problems, there are results.

On one side are the positives. On the other hand, due to the high concentration of many people living in just one city. In our platform we are thinking some new things. The first thing is that in our opinion Brazil has in its agriculture one of the foundations for a true development.

Brazil is an enormous country and produces only 73 million tons of grains per year. Brazil has 155 million inhabitants and exports millions of dollars of oranges to the States. But if each Brazilian drank an orange juice or each child had an orange juice per day, at least one cup of orange juice, we would have no oranges to export.

So the consumer potentiality in Brazil is enormous. And as we manage to upgrade living conditions of people, so we are thinking to make a combination; agricultural production and industrialization through the agribusinesses, that is one of the ways to leave people in their hometowns. And also the merchandising, trying to establish some kind of small, local market in a certain region.

Besides agribusinesses, we are also thinking of incentives for development of companies that could provide popular consumer goods. That is, we should manufacture shoes, manufacture garments, clothes, toys, school materials, that is to say, things that could generate jobs, and maintain people in their own homelands.

This is one possibility. The other possibility is through investing in infrastructure. We need to invest a lot in infrastructure, because we will also be solving the health problems that we have. When we talk about health issues in Brazil, we think only in hospitals or in terms of doctors, but when we think only in doctors or hospitals, we are not talking about health issues, but we are talking about diseases.

So, what we would want to do is invest in sewage networks, drinking water capacities. This way we can generate jobs, and improve the living conditions of our people. These are things that we considered, and with much less investment involved it is possible to start to create a new dynamic. People say, no, you have no money, but if we—if we end with punishing people that don't comply to the law and we diminish the corruption that occurs in the country and at the same time the fiscal invasion, we will be able to have conditions to make these projects work.

And besides this, we are going to try to increase our relationships with countries like the United States of America, with the Community in Europe, with Japan, open new frontiers with India, China so that we can make much more dynamic the possibilities that we have for the growth of our industries.

Mr. BALLENGER. One more question, if I may. Obviously, I can understand why the rest of the world would like to see the trade negotiations or the sanctions that we have against Cuba lifted, and I assume you would like to have the convention somewhere besides Miami which happens to have the largest Cuban population of the United States. Let me read a short paragraph from your platform:

Long years of resistance have left their mark in the essential segments of the Cuban economy. The situation became worse the moment the American Congress approved the notorious Torricelli law that gradually constrains commercial relations with other countries.

My understanding is that you speak very strongly in favor of opening negotiations and creating free trade with Cuba and you would not attend the convention in Miami because of the situation in Cuba. Thank you, sir.

Mr. LULA DA SILVA. [As interpreted.] One of the basic principles included in the manifesto of our party is the self-determination of the people. I think that the Cuban people, as the Brazilian people, and also as the American people, have the right to self-determination, to design their own fate, to elaborate their own economic policy, and organize the society as they want.

I think that the United States, a country is that has as a symbol the Statue of Liberty, has to start to think how it is going to solve this problem with Cuba. It seems that it is mission impossible. But 6 months ago, or even better 8 months ago, I was in Israel and had a conversation with the Prime Minister. We were discussing about the need for peace. The impression I had when I left and came back to Brazil was that peace would never be reached between Israel and the Palestinians. And now we are seeing that they just signed an agreement and even included the participation of the Americans.

So I think that we have to find a way out in the relationships between Cuba and the United States, because it is not fair. It is not politically correct, to punish one leader. People must pay the price for that. The embargo against Cuba is not causing damage to President Fidel Castro. It is causing damage to millions of people that start to have a series of problems, diseases, lack of medicine, and even lack of food. So how is it possible for you to have a law that says that you should defend the human rights, causing damage to innocent people? So I think that it is possible in a reasonable period of time we can try to find a way out for these relationships between the States and Cuba.

Our party defends that Brazil should have relationships with Cuba and at the same time, we should have a policy of defense of the right of self-determination of the Cuban people. And so that is why we are against the embargo.

Mr. TORRICELLI. Mr. Oberstar.

Mr. OBERSTAR. Welcome and we are very—welcome and thank you for being with us and sharing your thoughts on these very complex subjects. If, as you said a moment ago, you will face very serious challenges in dealing with inflation, economic development, protection of environment, and the needs of the indigenous people, I think the question for us is how can we in the United States help you achieve those goals and help you avoid the dilemma on the one

side of development supported by government of natural resources which can have very adverse effects on environment.

On the other hand, provide development that will create jobs with real incomes and with real economic opportunity. Or in the case of the indigenous people, to protect a way of life that does not deteriorate their economic condition.

Several years ago, about 30-some years ago, there was a severe cold snap in Brazil that greatly affected the coffee crop. Coffee prices, as a result, went very high in the United States. And an American observer complained that Brazil was selling coffee in 1960 at \$5 a pound and asked when is the price of coffee going to come down? And the Brazilian person he was speaking to said, "Our price of coffee will come down when you start selling us cars at a lower price."

Trade is a two-way street. And we in our trade, are being extractive. We are partners in the destruction. The projects like the CVRD, the iron ore mining development and Vale Do Rio Doce are not competitive and not productive investments that at the same time are destructive of the environment. So I invite to you say a few words about this dilemma and how you propose to provide for job growth, economic development, and how we in the United States can be helpful toward that end.

Mr. LULA DA SILVA. [As interpreted.] I believe that it is possible to create a development model that would cause less damage than the development model created all around the world for a long time. Today we are showing all this concern for the rain forests because we have only a very few rain forests left. Today we are concerned with sweet water and drinking water, because the drinking water we still have is becoming polluted. And now we are having more awareness about this because we want to survive.

And so I think it is very important to have awareness that we don't only want to live during our time. We have to think about the new generations that are coming and that life must continue on the planet. I am personally convinced that it is fully possible to develop the Amazon region without the need to have electric saws destroy the forest, because the day that we show competence, extract the richness that the biodiversity in the Amazon region offers us, we are going to earn much more money with the maintenance of that rain forest than with its destruction. For this we need investments in research, and research is something that is very expensive. And it is something that doesn't bring immediate results, and so this is what we are going to need support. For American institutions, German, French institutions, Japanese, from all countries, that want to preserve or conserve the Amazon region, contributing to improve the living conditions of the millions of Brazilians that live in that region.

Mr. OBERSTAR. Thank you.

Mr. TORRICELLI. Mr. Oberstar, thank you. Mr. Lula, we thank you for your time today and for sharing your thoughts with us. It has been an important opportunity for this subcommittee.

It is probably fair to now say that the next President of Brazil will have an influence over more issues of greater importance to people in Latin America than any other single individual. For more than a century, the nation with the most influence on the principal

issues in Latin America has not been a Latin nation at all, it has been the United States.

With this new agenda, that is probably no longer true. Whether or not a nuclear arms race returns to Latin America, probably rests with the judgment of the next President of Brazil. Whether or not resources that are needed for human development are wasted on a foolish arms race disproportionately probably rests with the export policies in the internal budget decisions of the President of Brazil.

Whether or not the international effort to control the destruction of the rain forests and other valuable environments is almost certainly in the hands of the next President of Brazil. And indeed, the international ambition of opening up markets to trade and lowering barriers, will be decided in this hemisphere by the next President of Brazil.

This is an enormous responsibility and an opportunity to do great things. All those things, I believe, are recognized. I will conclude this hearing by citing one more. There is the belief now that because more people are living in democracy and in capitalist systems than in any other time in history that this victory for freedom is permanent.

You and I know that in politics, as in issues of history generally, there are no final victories. In Brazil, as in Russia, and all nations that are struggling for their economic future to end disparities of wealth, to give rights to working people, and to protect the interests of the poor, either democracy or capitalism proves that it can soon serve their purposes, or, it, like communism, before it will be threatened and become part of history rather than a certain part of the future. There, too, the President of Brazil disproportionately is going to have an historic role.

Finally, the issue having been raised, I hope, too, that in the remainder of this decade, the cause of human rights and political pluralism no longer becomes such a singularly North American concern. It is time for the leaders of the great nations of Latin America to take up the cause of protecting each other's democracy and respect for human rights. It is fair to say that if Brazil had a military government, it probably would not be invited to the Miami summit.

If Argentina still had a dictatorship, it would not be visited by heads of state from throughout Latin America. If there were a coup in Venezuela or El Salvador against its elected governments, probably it would not enjoy foreign assistance or recognition. I believe it is time for the great nations of Latin America to hold that great standard now for all peoples.

The Governments of Haiti and Cuba, can be recognized into the family of nations in a simple ability to give the consent of the government to respect basic rights. That is all we ask. And I would hope as America pursues that policy, knowing that in your heart you feel as strongly about this issue as we do, that a future Brazilian Government takes that leadership to the United States in demanding that standard for dictatorships of the right and from dictatorships of the left. Knowing that to the people that you care the most about and their daily lives and their fight for rights and recognition there is no difference.

We have been honored by your presence here today. And we wish you every success and more importantly, the success of your people in furthering your democracy in this historic election. Thank you very much for being with us.

Mr. LULA DA SILVA. [As interpreted.] Thank you.

Mr. TORRICELLI. The subcommittee will now hear from the Honorable John Shattuck, the Assistant Secretary of State for Human Rights and Humanitarian Affairs and then we will return to our Brazilian guests for their testimony.

Secretary Shattuck, welcome to the subcommittee. We appreciate your being differential to Mr. Lula for your cooperation and patience and we welcome your testimony.

STATEMENT OF HON. JOHN SHATTUCK, ASSISTANT SECRETARY OF STATE FOR HUMAN RIGHTS AND HUMANITARIAN AFFAIRS, DEPARTMENT OF STATE

Mr. SHATTUCK. Thank you very much, Mr. Chairman. And I was most interested in the testimony and I appreciate the opportunity to have heard Mr. da Silva.

Mr. Chairman, I would like to thank you for the opportunity to appear here today. I commend you and the subcommittee for your strong interest in the field of human rights, and particularly the rights of indigenous people.

I have a prepared statement, which I will submit for the record.

Mr. TORRICELLI. Without objection, it will be entered at this point.

Mr. SHATTUCK. And I will provide some excerpts from it. Mr. Chairman, as part of our commitment to broaden and strengthen human rights advocacy by the U.S. Government, the Clinton administration is working to raise the profile of human rights abuses of indigenous people. This year, we have introduced a new section in our "Country Reports on Human Rights Practices", focusing solely on abuses of the rights of indigenous people throughout the world.

I would like to submit for the record the 1993 report on Brazil, because of its relevance to this hearing.

Although this is a worldwide problem, a particularly striking example of the abuse of the rights of indigenous people is the plight of the Yanomami people of Brazil. The cultural survival of Brazil's indigenous people depends on their ability to retain their own land.

Environmental destruction, disease, and delays in land demarcation threaten their future. Every Brazilian state has "reservas indigenas." The Yanomami reserve, the largest, is in the Amazon basin. Approximately 200,000 indigenous people live in this area where they frequently suffer discrimination and depredations by outsiders.

Last summer, a massacre of 16 to 18 Yanomami people took place along the border between Venezuela and Brazil. Immediately following reports of the massacre, the State Department urged that both governments take swift and thorough legal action to bring the perpetrators to justice. I met with informed nongovernmental organizations to learn more about the situation, and subsequently with the Brazilian ambassador to express our concerns, as did our Ambassador in Brazil on repeated occasions. In addition, the human

rights officer from our Embassy tried to visit the scene of the crime, but was turned away.

The Brazilian Government investigated the case and brought charges of genocide against 23 miners. Only two were arrested, however, and they were later released because witnesses could not be located. The case remained open, but prosecutors are having difficulty locating witnesses and the other miners accused of the massacre have not yet been found.

Responsible agencies in Brazil often have not taken effective action in response to the invasion of indigenous lands by outsiders. Although the 1988 Brazilian Constitution guarantees Indians' rights to traditionally occupied lands, the government has been slow to proceed with the demarcation of the indigenous lands.

Recently, there have been examples of several breakthrough decisions by courageous Brazilian Federal judges beginning to recognize Indian rights and Indian land claims, but so far these are relatively isolated cases by and large. Law enforcement is very weak in this area.

The Inter-American Commission on Human Rights has requested permission for an on-site investigation into the situation of Yanomami. Brazil so far has not granted permission, but we are urging the Government of Brazil to grant this request. Many Brazilian NGO's are promoting the rights of indigenous people and we urged the Brazilian Government to work with them. Rights of indigenous in Brazil and their environment also are affected by the invasion of their lands by loggers, squatters and gold miners. Loggers cut down tropical hard woods for commercial timber sales in contravention of the 1965 forestry code forbidding exploitation of resources on indigenous lands. Logging has eroded the physical and economic base of indigenous groups. The large sums of money being made in logging on the reserves almost exclusively benefit nonindigenous investors and speculators.

The roads which are developed for logging contribute to the destruction of the forest ecosystem and facilitate the movement of outsiders and movement in of disease to the indigenous people. Since the gold rush began in the Yanomami area in 1987, 10 percent of the Yanomami population reportedly has succumbed to diseases to which they had no resistance, including malaria, tuberculosis, influenza, sexually transmitted diseases, and even the common cold.

Messy gold mining practices have also wrought environmental damage. Use of mercury to separate the gold from other ore has resulted in extensive mercury poisoning. Although the extent of such poisoning is not well-documented, there is clearly an impact on the Yanomamis, who drink from and fish in the mercury-polluted rivers, thereby absorbing dangerous levels of mercury.

The United States is working on a variety of fronts that we hope will improve the desperate plight of the Yanomami in concert with others in the international community, and also the Government of Brazil. Many of the steps we are taking have been formulated in response to and in conjunction with nongovernmental organizations.

For example, the United States in cooperation with the G-7 and the Brazilian Government, is actively participating in the pilot pro-

gram for the Conservation of the Brazilian Rain Forest administered by the World Bank. This is a \$250 million program to promote conservation in the Amazon. In a recent international meeting, the Government of Brazil made a commitment to better control activities of small-scale gold miners who, up to this time, have encroached on indigenous preserves.

The U.S. Government has provided \$5.5 million as a contribution to the program. USAID's associated bilateral projects in rain forest preservation and water cleanup, are complementary to this program. Existing program components include research, demonstration projects, demarcation of indigenous reserves, planning for forest research management and environmental monitoring and surveillance. We hope we will be able to continue to support the pilot program in the future, given the tremendous significance to indigenous people in the region.

In conclusion, Mr. Chairman, this administration is deeply concerned about the plight of indigenous people at home and abroad. Mr. Chairman, as you know, President Clinton had a meeting last week in which he restated and broadened his own commitment to the protection of the rights of our own indigenous populations in the United States.

We are committed to protecting their individual human rights and we will strive to prevent the extinction of their cultures by forced assimilation. Thank you very much.

[The prepared statement of Mr. Shattuck appears in the appendix.]

Mr. TORRICELLI. Thank you very much, Mr. Secretary. My understanding now is that the annual human rights report issued by the State Department is going to make reference on a regular basis to the rights of indigenous people and whether or not they are respected.

Mr. SHATTUCK. That is right, Mr. Chairman. We began this practice in depth in 1993 with the first report that we put out as a Clinton administration, and we will continue to do so in the following years. We have issued instructions to our embassies all over the world to provide us with information about human rights issues involving indigenous people on a worldwide basis. And where that is an appropriate subject to take up, we will be having a section of each country report cover the issue of the rights of indigenous people.

Mr. TORRICELLI. You should know that in the authorization bill this year for USAID we have placed a requirement that USAID account to the extent to which American foreign assistance is being used to help indigenous peoples. This provides a real opportunity for you in working with USAID to support and encourage and find creative ways, since that economic assistance goes to the core of the human rights issue and the survival of these indigenous peoples. I hope it is an opportunity that you use.

Mr. SHATTUCK. I appreciate that opportunity, Mr. Chairman. As you know, we are working very closely with USAID in a range of human rights and democracy promotion issues. And certainly the close collaboration with USAID will be very much part of our overall program.

Mr. TORRICELLI. As part of this, the European Community has offered assistance to help Brazil, in particular, with you, I suppose other nations in general, with the demarcation of indigenous lands. Could you speak to whether or not the administration has contemplated giving similar assistance to these nations to help demarcate the natural and rightful lands of the peoples?

Mr. SHATTUCK. The 1988 Constitution in Brazil provided that indigenous lands be demarcated over a 5-year period. When that period ended in October 1993, about half of the demarcation had been completed. There is a good deal of work to be done in Brazil. Our G-7 program, the participation that we have with the European Community and the World Bank in the G-7 program, does provide for U.S. funding participation directly in this process.

Mr. TORRICELLI. For the demarcation—it is my understanding that that demarcation has not yet taken place and the funds have not yet been expended because of internal political opposition. Could you speak on that?

Mr. SHATTUCK. I am not aware of that issue, Mr. Chairman. I would be happy to look into that.

Mr. TORRICELLI. Would you write to the subcommittee for the record—and without objection, at this point the record will remain open for the administration's response on the status of expenditures to proceed with demarcation and explanations for why it may not yet have occurred and what obstacles might remain.

Mr. SHATTUCK. I would be happy to do that, Mr. Chairman. I understand that this is moving now. In fact, the funding is being expended, but we would be glad to amplify this for the record.

[The information follows:]

The funds for demarcation of Indian lands are part of Germany's US\$ 17 million contribution to the G-7 Pilot Program. Funds were not disbursed earlier because of a lack of agreement between agencies within the Government of Brazil (GOB). It now appears that all GOB agencies are in agreement to proceed, and negotiations are currently underway among the World Bank, Germany, and the GOB, with regard to the disbursement of funds for demarcation.

Mr. TORRICELLI. Yes, even glaciers are moving. It is a question of when they reach the sea.

Mr. SHATTUCK. I would point out, Mr. Chairman, that in our human rights report, one of the principal areas of focus on the situation involving indigenous people in Brazil was the issue of demarcation. We pointed out that only half of the lands that are to be demarcated had been done by October 1993. This is not an issue that is escaping our attention.

Mr. TORRICELLI. Can you see that to the extent that hydroelectric facilities flood lands for all rights and purposes belonging to indigenous peoples, or gold mining continues in indigenous lands, including, but not limited to the poisoning of waters with mercury in those lands, or forest destruction, or ranching or farming continues, including the lands that are for indigenous peoples, that they would by all rights and purposes be included in the human rights reports as violations of human rights?

Mr. SHATTUCK. Well, the issue of the preservation of the basic way of life and the aspects of indigenous life that needs to be protected from outside interference certainly would be covered. I can't

tell you in precise detail what aspects of each country we will be looking into—

Mr. TORRICELLI. Well, I want to set a baseline here. Speaking to the defense of human rights means relatively little if the people's lands can be flooded by a hydroelectric program or they can remain on the lands, but they will be poisoned because of the illegal spread of mercury into their waters. I would think this would have given evidence to the kinds of things that we would cite in the human rights report.

Mr. SHATTUCK. Certainly, the kinds of testimony that I cited in my testimony is the kind of thing which is to be cited in the human rights report.

Mr. TORRICELLI. Whether we look to the violations of rights of these peoples to the extent that mercury or other chemicals are being used to mine for gold that lead to the death and destruction of indigenous peoples and those chemicals are coming from corporations in the United States, then indeed, among those who should be cited for human rights abuses against indigenous peoples would be our own country.

Is there a means by which the administration, seeing this abuse, can be communicating with these companies or otherwise seeking to stop their export?

Mr. SHATTUCK. Well, Mr. Chairman, obviously, I would want to look at the facts of any situation. The issue of export controls is certainly one of the many instruments that is available for the promotion of human rights. There are many economic and other legislative and regulatory vehicles that can be used to promote human rights. And one would want to look closely at the facts and evaluate whether or not—

Mr. TORRICELLI. Here is the suggestion. Before the Miami Summit of Latin American Leaders, this subcommittee is going to visit a number of Latin American capitals. Among my suggestions for the summit will be that controls on importation and exportation of these chemicals be addressed as well as international cooperation in monitoring their sales.

Certainly, as well, the funding of international projects that are leading to the destruction of these habitats, including engineering services and construction assistance, providing of elements for the production of electricity that go to these damming projects. We may no longer be part of World Bank funding for the massive destruction of these habitats, but at the same time we are looking to sell turbines or other industrial equipment that goes into the project.

We are not only not part of the solution, but we continue to be part of the problem. I would hope that would be a part of the summit agenda, and indeed this host of issues that goes to the destruction of indigenous peoples.

Are you similarly contemplating coming up with suggestions for the administration for the summit agenda?

Mr. SHATTUCK. We are very much involved in the planning of the summit agenda, and I might point out Mr. Chairman, that a wide range of agencies are involved. Certainly, the environmental agencies are deeply involved, and the Bureau of Environmental Sciences in the State Department is also involved. So the topics that you have described and the issues involving the destruction of an envi-

ronmental system are on the agenda of the U.S. Government as it prepares for the summit. The work on these issues is being done primarily by parts of the government other than my own.

Mr. TORRICELLI. At some point here soon we are doing a hearing on agenda items for the summit, at some point in June. If in advance of that we could have your cooperation on the items that you believe should be on the agenda at the summit, we would be appreciative. Mr. Smith.

Mr. SHATTUCK. We would be happy to do that. Mr. Chairman.

[The information follows:]

Mr. Chairman, an experts' working group estimated under the auspices of the U.N. Human Rights Commission has been preparing a Draft Declaration on the Rights of Indigenous People(s). It is, as yet, unclear when the working group will complete its efforts and formally transmit the draft to the Commission for consideration by member governments. However, in anticipation of that development, we at the State Department have been actively engaged in studying the issue in all its ramifications, so that we will be able, in conjunction with the U.S. Government's domestic agencies, to formulate a meaningful, forward-looking position on the Draft Declaration. Our representatives have been following the working group's efforts closely. In so doing we well recognize the need to respond to the mounting impetus to address the needs and rights of the indigenous while bearing in mind the range and complexity of our interests and objectives around the world.

Mr. SMITH. I have a couple of questions. The Human Rights Watch Report for 1994, in the section dealing with Brazil, continually uses the word "impunity" describing how street children or indigenous peoples have been often killed by off-duty policemen and military. Then the report says there was a marked increase of targeted assassinations of world activists. "Impunity" is used throughout this document.

In the section on U.S. policy, the report points out that despite close economic ties, the United States failed to use considerable leverage to press for improvements in Brazil's human rights record during 1993, and the absence of public U.S. comment was particularly glaring. On the other hand, the European Community has been very outspoken in its statements. How do you respond to that criticism of the administration?

Mr. SHATTUCK. Well, I wish when the Brazilian Government comes in to complain to me about the very strong words that we have used about human rights abuses in the 1993 country report and the public statements that we have made very similar to the ones that the Human Rights Watch report indicates, I wish that that would be entered into for the record, because I think you would understand that the strength of the concerns that we have demonstrated in our report, which I have submitted for the record on the issues of extrajudicial killings, the killings of street children, and the plight of indigenous people, is very strong indeed.

We have made statements. The report itself was given worldwide coverage and Brazil was one of the countries that we focused on. Of course, we issue reports on 193 countries around the world, so it is a very carefully constructed and clear document that goes into human rights abuses for each country, but Brazil was very much a focus of it and the report that we have done has been submitted for the record.

Mr. SMITH. Mr. Secretary, Human Rights Watch points out in the exception of the generally accurate chapter on Brazil in the

U.S. Country Report that the U.S. Government issued few public statements on human rights violations in Brazil. It has been the absence, from their point of view, of timely and persistent, and I would say consistent, comments on these violations as they take place or shortly thereafter that is the brunt of the criticism.

Mr. SHATTUCK. These issues are very much on the bilateral agenda of the United States and Brazil. They have been voiced frequently by the Secretary of State as well as myself in discussions that we have had with the Brazilian Government and in discussions with the Brazilian ambassador here as well as with our Ambassador in Brazil. So there has been no lack of dialogue on questions that we raise in the report regarding human rights issues.

Mr. SMITH. Apart from the very modest U.S. aid that is provided to Brazil, what policy considerations are made by the administration prior to voting in favor of loans to Brazil at the World Bank or at the Inter-American Development Bank?

Mr. SHATTUCK. Well, the general policy that we follow with respect to voting for loans for the Inter-American Development Bank or the World Bank are that the general conditions for human rights are of importance, but we will support loans unless there is a situation where a country is likely to be regarded as a gross violator. Certainly, with respect to loans for Brazil. The work that we are doing with the World Bank is intended to promote the rights of indigenous people such as the Yanomami Indians. We do take those issues into consideration.

Mr. SMITH. We had hearings on NAFTA as you might recall, and several of the human rights organizations very bitterly complained that human rights didn't even get a back seat during those considerations. Certainly, in the final NAFTA document there was nothing that would trigger retaliation. It is very likely, I think, that as we go through this decade, a number of Central American, Latin American, and South American countries would like to enter an agreement analogous to NAFTA.

Supposing that were to occur with Brazil, would you be in favor of including the full range of human rights issues in that negotiation?

Mr. SHATTUCK. Well, we have, in general answer to your question, in the post-Uruguay round of considerations of trade issues, the President himself has directed that issues of worker rights and human rights be directly engaged in a whole range of U.S. trade relationships. And strong enforcement of the worker rights provisions of the centralized system of preferences, I think, is one indication of the work that is being done by the U.S. Government to infuse trade relations with general human rights protections. That should certainly be the case with respect to hemispheric trade relations, and I expect it to be so.

Mr. SMITH. Thank you.

Mr. TORRICELLI. Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Thank you, Mr. Chairman. I just wanted to personally welcome you, Mr. Secretary. I think this is the first time that I have had the chance to welcome you across the panel here. Could you elaborate further on your comment about the Inter-American Commission on Human Rights? I am not familiar with its activities. Is it affiliated with the OAS or does it have its own

entity? Is it an effective one? What is your opinion? Are we doing anything effectively out of that commission's dealing with human rights in Latin America?

Mr. SHATTUCK. The Inter-American Commission for Human Rights is an example of the kind of institution that I think on a regional level can be an effective promoter of human rights. It is a part of the OAS, and it has a close relationship to the OAS machinery. It gives it the kind of prominence that it needs. But certainly the cooperation of governments working with it is important.

I might point out that the Inter-American Commission for Human Rights is going to Haiti within the next week or 10 days. The United States strongly endorses that mission. It can be an effective means of pursuing issues of human rights, such as the terrible plight of the Yanomami Indians. We have been urging the Government of Brazil to allow the Inter-American Commission on Human Rights to look at that situation.

Mr. FALEOMAVAEGA. From a broader point of view—and I wanted to ask your opinion, if you disagree with me that in dealing with our friends and partners throughout Latin America when we talk about indigenous peoples, it seems to be a mum case. Nobody really wants to talk about it unless they are forced into it. Do you agree with that or disagree with that opinion?

Mr. SHATTUCK. I am not sure I really have an opinion on it.

Mr. FALEOMAVAEGA. The point I am making on this issue is that, as the right of a sovereign country, it is an internal matter and that you are not to pursue it.

And I just wanted to ask you, if we are doing this on an even playing level when we talk about human rights in our dealings with China, as an example, we are putting the carrot out and on all this trade stuff on China. And, in fact, I understand you were even allowed in China to talk with some of the dissidents and some who were not necessarily supportive of the government.

And you had indicated earlier that you were not allowed to go to Brazil when these murders took place to find out if these things were on a fair basis as far as the treatment of these Indians that were murdered in that instance. Can you comment on this?

Mr. SHATTUCK. Well, first, let me be clear for the record. What I said regarding the human rights inquiry into the Yanomami Indian massacre was that a human rights officer from the Embassy in Brazil, the U.S. Embassy, had attempted to go to the scene, but she and others were not permitted to do so. There was investigative information being collected.

This can be often the case in our own country as well when someone wants to visit the scene of a crime. All I wanted to say, by pointing out that incident, was that it demonstrated, I think, the interest of the U.S. Government in the issue of the rights of the indigenous people in Brazil, and particularly in this incident. I think it is fully within the sovereign power of the law enforcement agency to decide who is going to get access to the scene of a crime. That is perfectly reasonable.

Mr. FALEOMAVAEGA. In your best opinion, do you feel that our policy on human rights throughout the world is evenhanded? I mean, the same thing that we are advocating against China we are doing against Mexico, Brazil or any other country that may have

problems in dealing with its indigenous—not just indigenous, but any issue affecting the rights of human beings.

I think you will understand that I think the Vice Premier of China said that the most basic human rights now affecting the people in China is just putting food on the table. That is a basic human right that the government there is struggling very much to sustain, to feed 3.3 billion people, quite a challenge.

But I wanted your opinion, in your honest judgment, that the policy of this administration is that we are applying the principles of human rights evenly among the countries that we deal with, whether they be Brazil or any other country?

Mr. SHATTUCK. We certainly do our best, and I would say that there are many governments around the world that would be very happy if we didn't do it at all. I think that is probably the best indication of the relatively evenhanded approach that we have. You will find governments the world over in every continent who would prefer not to have issues of basic universal human rights taken up.

I might also say, having just returned from Central and East Africa, and having been engaged in the early efforts at bringing in the United Nations to develop an inquiry into the terrible, terrible situation in Rwanda, that the governments in that part of the world are very eager to see the engagement of the United States and the world community on basic questions of human rights.

I think our approach to this is universal, evenhanded. It is a very, very large and complicated world that we live in today. The most encouraging thing that I see as I work on these very difficult issues is the grassroots movement for human rights and basic principles of democracy that is fundamentally reshaping our globe, and is coming from within every country. It is not something coming from outside. It has nothing to do with outside pressures of the United States or anybody else. It is the will of the people on a worldwide basis to press for their own rights. These are not governments, but these are individuals and groups. And it is on their behalf that the U.S. policy is advocating improvement in universal human rights.

Mr. FALEOMAVAEGA. So, in your best judgment, this administration will not give a deaf ear to some problems as far as human rights are concerned.

Mr. SHATTUCK. We will do our best.

Mr. FALEOMAVAEGA. You will address it in the best way possible.

Thank you, Mr. Chairman.

Mr. TORRICELLI. Thank you very much, Mr. Secretary. Thank you for being with us and, again, for your patience.

The subcommittee will now hear from Dr. Schwartzman, anthropologist, Environmental Defense Fund; Davi Yanomami for the Yanomami nation; and Marta Guarani, for the Guarani community.

We welcome each of you to the subcommittee. Of course, any prepared remarks we will enter into the record, but we would informally like to hear some opening comments. I would urge you, though, to keep them as brief as possible so that we can engage in a conversation. There are a number of things we would like to ask, engaging in this discussion.

Mr. TORRICELLI. Dr. Schwartzman, would you like to begin?

**STATEMENT OF STEPHAN SCHWARTZMAN, ANTHROPOLOGIST,
ENVIRONMENTAL DEFENSE FUND**

Mr. SCHWARTZMAN. Thank you, Mr. Chairman.

I am testifying today on behalf of the Environmental Defense Fund, the National Wildlife Federation and the Sierra Club. These organizations nationally have more than 6 million members. Many of our members will be very pleased to know that you have invited these respected indigenous leaders here today and that you are promoting a better informed and broader dialogue between the United States and Brazil by having called one of Brazil's most important political leaders to speak today, Mr. Lula da Silva.

Mr. Chairman, we endorse your view of the connections between indigenous peoples' rights, human rights and the environment. You are going to hear from Davi Yanomami and Marta Guarani about specific, urgent situations—invasions of indigenous lands, flagrant human rights abuses, virtually unbelievable miscarriages of justice—where you and your colleagues' direct expressions of concern to the appropriate authorities can make an important difference. We urge you to attend to these requests.

This hearing is an important contribution to the international dialogue on these issues, but it is only a beginning. As you and your colleague brought out very well, many policymakers in Latin America need to understand that here in the largest industrial nation in the world, indigenous peoples have not gone away, and their problems continue to be national problems.

The upcoming Summit of the Americas is an excellent opportunity for our government not to lecture Latin America but to demonstrate the importance we place on the issue and invite indigenous people to explain their situation.

How, after all, can we address economic development in the hemisphere without addressing the state of the 40 million poorest people in the hemisphere? How can we discuss good governance without talking with those with the least political representation? How can we act to stop the loss of biodiversity, probably the most important environmental issue in our hemisphere today, without talking to those whose land everywhere coincides with the remaining repositories of biological diversity?

If the United States is to be a leader on indigenous peoples' rights in the hemisphere, we must set the example of participation and frank discussion here. Perhaps this subcommittee can see that this kind of an approach to indigenous peoples' concerns is reflected in the agenda for the Summit of the Americas.

Mr. Chairman, you will hear from Davi Yanomami and Marta Guarani about the effects of gold mining and other environmentally disastrous land uses in their areas. I want to touch very briefly on the timber trade because this is an area where both our consumption here in the United States and our example have direct effects on deforestation worldwide.

In the Amazon and Canada and Indonesia as well as here in the United States, the timber trade is on the cutting edge of devastation. It is opening up the last remaining forested areas in the world to destruction, and it is a textbook case of unsustainable development in which a few private actors benefit at enormous public, and environmental, cost.

We can begin to do something about this, first of all, by moving to make timber production sustainable in the United States, but also by giving consumers the information they need to create incentives in the market for sustainability. People and businesses in the United States want to know where the wood products they buy come from and what they are. When they know this, they can begin to create a real market for sustainably produced timber.

We strongly encourage you and your colleagues to see that U.S. consumers get the information they need on the origin and species of the timber and wood products they buy as a critical first step in using the power of the U.S. market to create incentives for sustainable timber production.

Mr. Chairman, I thank you again for the opportunity to speak here and especially for having brought together this exceptional group of witnesses to address the subcommittee.

Mr. TORRICELLI. Thank you very much.

[The prepared statement of Mr. Schwartzman appears in the appendix.]

Mr. TORRICELLI. Dr. Davi Yanomami and Marta Guarani, we welcome you both to the subcommittee. We are very proud to have you here today.

I have visited the lands of the Yanomami. Unfortunately, I have not had that opportunity for the Guarani. But I know something of each of your plights.

When people in the world today talk about abuse of peoples, they think of Bosnia or Rwanda. When they think about human rights abuses, they may debate about China or other lands. In fact, after visiting Brazil, when I think of either of these concerns, I will think of each of your peoples.

If the world only knew of the continuing suicide of the Guarani people because of the loss of their lands and the hopelessness of the future, I know they would respond. It has, however, been difficult to get the media and the leaders of the international community to know this problem, and, therefore, to raise the ire of the international community.

If much of the international community knew of the poisoning of the water and the destruction of the lands of the Yanomami, they would raise their voices in a chorus of horror at what has happened to these people who want only to live in peace in their traditional lands. We have asked both of you to be here to bear witness to this tragic destruction. Knowing that time is listed among your enemies, that if indeed the recognized rights of the Brazilian Constitution that both of you have but neither have enjoyed are not soon given, one day no one will be able to be here to bear witness any longer.

The future of your peoples, more than anyone else I know of leaders anywhere, are in each of your hands. We thank you and admire you for being here today to give testimony to what has happened to the destruction of your peoples and their lands. And I thank you.

Mr. TORRICELLI. Davi Yanomami, if you would like to proceed at this point through translation if that would make you more comfortable.

STATEMENT OF DAVI KOPENAWA YANOMAMI, SHAMAN AND SPOKESPERSON FOR YANOMAMI NATION

Mr. YANOMAMI. [As translated.] In the first place, I would like to thank you for having been invited here and the possibility to speak to this commission. It is very important for the American Congress to ask the American Government to ask the Brazilian Government to remove all of the gold miners from our lands. The government, the Brazilian Government, does not listen to what we are saying, and this is why we, the Indian people, are suffering.

The Yanomami lands were demarcated. However, they are not being respected or guaranteed. The Yanomami people want the Brazilian Government to obey the law. We want the law to be respected. Otherwise, we will say that the law is not worthwhile to exist, to be. This is what I want to tell you in the Congress.

It is important for you people also to obey the law so that all people on earth should be respected and the preservation of the rain forest also be respected. It is important that the Brazilian Government demarcate all of the indigenous lands that haven't been demarcated yet. If this is not done, the indigenous lands are not demarcated, they will—the indigenous people will die off and with them also nature.

So this is what I wanted to tell you, because you are here to defend the law and also to preserve all of the people of the universe.

I want also to speak about Haximu, the massacre of Haximu where the gold miners have killed off 16 of our people. We were eight warriors who went to look for the site of the massacre to encounter where our people had died. We, the Yanomami people, have seen how many have died. We are very upset about the fact that the Brazilian Government and FUNAI is not putting the murderers into prison.

In the beginning, the Federal police had arrested two gold miners, but today they are free. We are very much afraid that gold miners are free, and they are preparing another genocide against us. As I am one of the Yanomami, I live on my lands. I don't want this to happen again.

We have to live. We have the right to live just like you do, people. We are people. We are human beings, and you have to help us.

If I had no problems, I wouldn't come here and sit here with you. Now I came here so that I can speak about the problems of my people. For me to come here took a long time. It is very far away, our lands, and it also is very expensive.

It is very important for me to have this opportunity to have come here and to try, through you and with you, to resolve our problems. You are people who work hard, and you have the obligation to resolve our problems. You have to take care. It is our obligation to take care of the mountains, of the earth, of the people, of the wind, the rain, all people of the world.

We want to continue to live our lands, and without lands, we will die off. There is no life. You have to preserve our lands. You have to preserve our forests, our life. And we hope this meeting between us will help in this, and we want to thank you very much for having listened to us.

Mr. TORRICELLI. Thank you very much.

[The prepared statement of Mr. Yanomami appears in the appendix.]

Mr. TORRICELLI. Marta Guarani.

STATEMENT OF MARTA GUARANI, LEADER OF THE GUARANI-KAIOWA COMMUNITY OF JAGUAPIRE

Ms. GUARANI. [As translated.] Sir, I would like to very quickly, because of the question of time, to thank this House and to thank Bianca for this opportunity.

In the state of Mato Grosso do Sul we are 55,000 indigenous people and 35,000 Guarani. We live in 21 communities or villages. Nine thousand are Guarani Indians who are expelled from their lands.

One of the most gravest situations is the case of Jaguapire on an area that is already homologated. Two hundred sixty people live there and are still threatened with being expelled, and if this happens my people will commit suicide collectively.

In the areas of Shaquadi and Shaquada, my people have also been expelled, and they are going through a lot of hunger and a lot of misery. They are very tired in the FUNAI office of Amombi. They have taken over the office because they have been tired of waiting for this lengthy process of demarcating the lands, and they think that the law should be respected and complied with so that they have the right to occupy and live on their lands.

In Mato Grosso do Sul, they have already occupied those lands, and it seems like that there will be a war with the white people who have come in and taken their lands. There may be a confrontation and a war with the military police.

So I would like the American Government to pressure the Brazilian Government, the Brazilian judicial system, into demarcating all of the indigenous lands in Brazil or I would like the American Government not to give any funds to the Brazilian Government unless there is demarcation of all indigenous lands and, in particular, those of the Guarani, because we are not being respected. Our rights to our land, our rights to our culture and our very lives are not being respected, not even when it is in the Brazilian Constitution.

Thank you.

Mr. TORRICELLI. Thank you very much for your testimony.

[The prepared statement of Ms. Guarani appears in the appendix.]

Mr. TORRICELLI. Davi Yanomami, I wish that every stockholder, executive, and board member of American, European, and Asian companies that produces mercury could be here to witness the fact that the products that they are selling in Brazil is being used for unhealthy purposes. It would be no different if they were selling a poisonous gas to military forces at war with an innocent people. These mercury products are being used for human destruction. I wish every one of them could understand the consequences of exactly what it is that they are doing.

It is my own understanding that those who have been identified as being involved in the murder of your people have not been brought to justice so that they are not serving terms for these crimes. Is that correct?

Mr. YANOMAMI. [As translated.] There were two gold miners who were arrested, and they were put into prison. However, they were let out again, and now they are free.

Mr. TORRICELLI. So, at this point, of all of those who were identified, brought to justice on these murders, no one is serving time?

Mr. YANOMAMI. [As translated.] The garim peiros were identified and were put into prison for less than 2 months, had lawyers, and through their lawyers they got free.

Mr. TORRICELLI. The FUNAI now for the Brazilian Government, is there any appreciable effort by them now to expel gold miners? Are you seeing people arrested and expelled from your lands in significant numbers?

Mr. YANOMAMI. [As translated.] FUNAI is the agency that is supposed to protect the Indians. However, they and the Brazilian Government say that they have no funds to pay the Federal police who are supposed to take the action of taking the garim peiros, the gold miners, out of our territories. So the garim peiros continue on our land, and I am very much afraid that there may happen another massacre.

Mr. TORRICELLI. But do you ever see people being expelled? Is it rare? Does it happen sometimes? Or is it never happening?

Mr. YANOMAMI. [As translated.] The government only acts when it is under pressure.

Mr. TORRICELLI. Marta Guarani, your lands in which your people have lived since antiquity, I would assume, are supposed to be protected under the Brazilian Constitution. Is it correct that the problem has been that the courts simply will not make the decisions to offer you the protection that is already afforded under the Constitution?

Ms. GUARANI. [As translated.] If that is what it is, I am not sure, but what I do know, because I live there and I know what is going on, that our area is on the frontier, on the border area. We are also surrounded by large landowners, and we are—and there has been studies that show that our people are the poorest people in Brazil, we have been the most abandoned, and that is the situation that we live in.

Mr. TORRICELLI. My understanding is that the Ministry of Justice has even identified that your lands by law should be protected, but the judges simply will not issue the rulings to expel people from taking what is rightfully yours.

Perhaps you could tell us further, is it the loss of these lands that makes it difficult for people to find food because of the destruction of the forests or is it simply a change in habitat?

Ms. GUARANI. [As translated.] Sir, the major question is that of the land and access to the land. Many times the government will—or the court will give the right to the large landowners and will not listen to us, and so that is one of the major problems that we do not have access to the lands.

Also, overpopulation of these small lands that we have been given is another major problem, because the land keeps getting smaller, and our people continue to grow.

Mr. TORRICELLI. Mr. Smith.

Mr. SMITH. Thank you, Mr. Chairman.

I want to thank this very distinguished panel for their testimonies today, which are very, very helpful to this subcommittee and, by extension, for the rest of Congress and the American people who will read of these proceedings. Certainly the plight of the indigenous peoples have been furthered by your appearance here, and I am very, very grateful to you for taking the time and effort to be here, to make that case known.

When Ms. Menchu received the Nobel peace prize a couple of years ago, many of us thought that the plight of indigenous peoples would be much more furthered because people would now know that this is not an isolated case, that people around the world are trying to live in peace, in harmony, without encroachment.

Could you give us an assessment as to how you are viewed in Brazil, in particular, and perhaps elsewhere?

We all know that politicians often move where they think there is the greatest amount of good for their own aggrandizement and their own well-being, rather than for the good of the people themselves. Do the polls show in Brazil, for example, that you have the solidarity of the majority of people for your plight, Mrs. Guarani.

Ms. GUARANI. [As translated.] As an Indian woman, I think that the knowledge and the recognition of our causes is yet very small. I am only here today to talk to you because on the 3rd of January there was going to be an eviction from our lands in Jaguapire and Bianca Jagger went to the area. She was one of the only people here from New York who came to the area, and she saw what was happening, and that is the only reason why we are not expelled from our lands.

Mr. SMITH. Let me applaud the work of Bianca Jagger. I know that she has done good work elsewhere. For example, another hat that I wear—as ranking on the Helsinki Commission, I know that she was very, very helpful in visiting Bosnian women who were being raped in massive numbers as part of the Serbian aggression in that part of the world. Indeed, she does a lot of good, humanitarian work.

Dr. Schwartzman, did you want to comment on that question? Or Mr. Yanomami?

Mr. SCHWARTZMAN. I think I will defer to Davi Yanomami.

Mr. YANOMAMI. [As translated.] I am very worried because the politicians from the state of Amazon and Rondonia are speaking of changing the law, the Constitution, and there is a very strong pressure that the lands that were demarcated, the Yanomami lands, will be revised. That means that they will be diminished.

They are threatening with that, and we, as Yanomami people, under no circumstances want this to happen. We want that the lands, the way they were demarcated, should be respected.

Mr. SMITH. Mr. Schwartzman.

Mr. SCHWARTZMAN. Yes, if I could add to that.

I think, first of all, Indians in Brazil are a very small minority. Nonetheless, in the large urban centers over the last 5 to 10 years there has been a change in public opinion on these issues. I mean, there was a recent public opinion poll in major newspapers that shows quite clearly that there is a much more positive sentiment in regard to indigenous peoples' land rights than there was in the past.

But in areas that they were just mentioning or in the Guarani area, the regional elites in particular have direct interests in those lands, and that is where the kind of problems that you are hearing here are derived from. So international attention has affected popular opinion, but only to a certain point.

Mr. SMITH. Thank you.

Just one final comment, because I know we are kind of late into the day.

I want to implore Ms. Guarani on behalf of all who value life—and I know that goes for everybody in this room. While the threat has been made for mass suicide, almost a modern day Masada seems to be a potentiality here. I would hope your cause can be successful without resorting to that kind of action.

You know, human rights are meaningless if they are not applicable to the most vulnerable. Certainly the small number of indigenous people, relative to the rest of Brazil, could be a test case for Brazil, whether or not human rights are truly respected. Certainly, it seems to me, Brazil needs to respect indigenous peoples.

My hope and my prayer is that your people will not resort to that means of gaining the attention of your countrymen, as well as the world at large.

Thank you.

Mr. TORRICELLI. Mr. Faleomavaega.

Mr. FALEOMAVAEGA. Mr. Chairman, I just want to echo the sentiments that you expressed earlier about the problems dealing with the Yanomami tribe as well as the Guarani tribe.

I wanted to ask Dr. Schwartzman if—to his knowledge, how effective is the Brazilian court system as far as civil rights' issues? If they do have those opportunities to file in court and if the courts do make pronouncements, are they effectively enforced by the Brazilian Government?

Mr. SCHWARTZMAN. Well, the record is clearly mixed. There have been in the last year—year and a half—there have been a number of notable, positive decisions of the Federal Prosecutor's Office. The Federal Attorney General's Office has taken some positive actions with relating to illegal logging on indigenous lands, to some extent, mining.

The situation that Marta Guarani is describing here is a gross, flagrant aberration of justice in terms of the law as I understand it. You have an area that has been—various areas that have been demarcated according to the Brazilian Constitution while local courts refuse—continue to decide in favor of ranchers that are invading the territory. That is of—to that extent, there are indeed very serious problems in the effective rule of law in these areas.

Mr. FALEOMAVAEGA. We have—you know, the administration is always critical when the Congress gets into areas of foreign policy, and I just wanted to ask what might be your suggestions on how we could best effectively bring this to the attention of the Brazilian Government to enforce the rights of these Indian tribes as far as possession of lands, the environment.

I wanted to ask your suggestion, Mr. Schwartzman, if by way of resolution how we can effectively petition the Secretary of State or the President, as you have heard earlier from Secretary Shattuck that this administration is very serious about bringing about ac-

knowledge—not only acknowledgment, but wanting to see that the Brazilian Government is really going to do something about it.

This has always been my criticism: a lot of rhetoric, a lot of talk, but when it comes to real application—I am just curious what might be your suggestion as to how we can effectively pursue this.

Mr. SCHWARTZMAN. In my prepared statement I have a number of points. I don't want to go through them all right now.

Mr. FALEOMAVAEGA. Can you speak a little louder?

Mr. SCHWARTZMAN. In my prepared statement I do have a series of points speaking to that very issue. I don't want to go through them all right now.

I do think that it is critically important, as Yanomami and Marta Guarani have brought out here, to pay direct attention—to express your concern directly to the Brazilian authorities, as you have done, to continue that level of attention. That is quite important.

I think that at this point perhaps we need to go beyond that. Many policymakers in Latin America believe that this kind of concern only comes out of moments like this in the United States. And the Summit of the Americas is a good opportunity to, I think, show that in the U.S. indigenous peoples' issues are important domestically.

As you were pointing out, there was a historic summit in the White House. We need to reflect that kind of concern to show political leaders in Latin America that that issue is important to us here as well. I think that that could have an exemplary effect.

There are other steps. For example, a U.S. contribution to the G-7 pilot programs indigenous lands component would be a very positive step. The United States has not committed significant resources to that program, and it offers the opportunity of supporting further demarcations of indigenous lands in Brazil.

Mr. YANOMAMI. [As translated.] May I ask you if you have the power to encourage the President of the United States to speak to the President of Brazil about the question of justice?

And, also, it would be, I feel, interesting to be able to send some kind of a message to the Minister of Justice about the massacre of Haximu of last year.

Mr. FALEOMAVAEGA. Well, you know, I have stated earlier in my question to Mr. Shattuck as well as Mr. Lula the issue of the rights of the indigenous peoples not only of Brazil but throughout Latin America and even in our own country here as well as Canada. The issue is not just Brazil.

And the question I have always raised is that, when it comes to the rights of indigenous Indians throughout Latin America, nobody wants to talk about it. Only of the recent uprising in Chiapas that all of a sudden everybody is now cognizant of the fact that there is a very serious problem not just in Mexico but throughout Latin America.

And with Mr. Yanomami—maybe—I would like, Mr. Yanomami—maybe I will ask my Samoan tribe to come over there. Maybe they might need some help. I don't know. A call to all of the indigenous people to come and give assistance. Of course, that is near impossible.

But I am just wondering what would be the kind of application of the kind of pressure that leaders of our country could give and,

at the same time, recognizing that we have the same problems here dealing with native American Indians. You know, it is not an easy issue. But if the people of the Guarani tribe are committing suicide rather than to leave their lands, that is a very serious problem here.

And I would like to appeal to you, Mr. Chairman, that maybe this is something that we certainly in this subcommittee ought to take some kind of action by way of petition or resolution or something so that the Brazilian Government can see the seriousness of the problem.

And I would like to pay my special tribute to the bravery and the courage of the Guarani tribal members that they would rather sacrifice their lives than to leave their lands. This has happened historically even in our own country here.

Mr. Chairman, I really want to thank you for taking the initiative to bring out this very important matter, and I hope that we might resolve it by way of, somehow, finding some solution to this problem. I certainly thank all of you.

Mr. TORRICELLI. Thank you for your comments.

In the succeeding months we will have some of these opportunities, particularly in the agenda for the Latin American Summit in Miami, if we can encourage the Clinton administration to go to Miami with strong support throughout Latin America to raise not only the general question of the rights of indigenous peoples but specifically the proliferation of these chemicals that are contaminating water and the failure to respect provisions of the Brazilian Constitution in recognizing the maintenance of these lands, the people who historically have lived on them and owned them as a matter of law in addition to as a matter of natural right.

That is our best opportunity in the coming months, and the subcommittee will not lose that opportunity to press the case on every occasion.

I thank Dr. Schwartzman for your participation today. Obviously, Davi Yanomami and Marta Guarani, we pledge to you our continuing interest and support. You will be in our thoughts, in our every effort. I can assure you that no businessman, civic, academic or governmental leader from Brazil will ever pass through the corridors of this Congress without this issue being raised for assistance on any level ever given without the respect of your rights being an inherent condition thereof. Thank you for being with us.

The subcommittee will now hear from Dr. Thomas Lovejoy, Assistant Secretary of Internal Affairs, Smithsonian institution; Dr. Tucker, along with David Skole, University of New Hampshire; and Professor Balée, Department of Anthropology, Tulane University; while the chair bids farewell to our guests.

Gentlemen, welcome to the subcommittee. I want to thank you for your considerable patience today both in hearing from Mr. Lula da Silva and our visitors, the indigenous peoples of Brazil.

Gentlemen, welcome to the committee. I want to thank you for your considerable patience today, both in hearing from Mr. Lula da Silva and the indigenous people of Brazil. It was a rare opportunity for this subcommittee. I am sure you understood that fact, and I hope that we have not offended you in keeping you so long.

We welcome you. First to Dr. Lovejoy: it is in large part in obligation to him that this day has been possible in helping to introduce at least this member, and I know indeed many other members of this institution, and, in fact, Vice President Gore, to the issue of the problems of indigenous peoples and the destruction of the Amazon generally, as you have done for other members.

I would not have the knowledge that I am at least beginning to be able to accumulate without you and the work of your staff and your efforts throughout the years, and for that I am very indebted. Welcome to the subcommittee. We look forward to your testimony.

STATEMENT OF THOMAS E. LOVEJOY, ASSISTANT SECRETARY FOR EXTERNAL AFFAIRS AND THE ENVIRONMENT, SMITHSONIAN INSTITUTION

Mr. LOVEJOY. Thank you, Mr. Chairman, for the generous remarks and for the opportunity to make a few comments this afternoon about the topic of deforestation in the Brazilian Amazon. I will, if I might, submit the written testimony for the record.

Mr. TORRICELLI. I feel comfortable in saying that there will not be an objection.

Mr. LOVEJOY. And I would like to sort of sketch the situation, which my colleagues specialize in and can talk about in much greater detail.

The United Nations conference on environment and development really stimulated the whole world to think about what sustainable development really is. And although we are still in hot pursuit of what sustainable development means in all its details, it is abundantly clear that biologically based development has to be a major piece of it, simply because of the ability of plant and animal species to renew themselves.

And if that is the case, one immediately gets concerned about biological diversity and the ability of millions of plant and animal species to contribute to human welfare and economic activity. And that inevitably leads one first to Brazil as the country which has the greatest fraction of the planetary total of biological diversity. We think of it usually in terms of its forests, but it also involves fresh waters, more fish species in the Amazon than the entire North Atlantic. And the intricate relations between the flood plain forests of the Amazon and those fisheries so important in support of people there.

I thought it would be interesting, if I compared the difference between the Brazilian Amazon in 1965, when I first stepped off the airplane as a timorous graduate student, and 1994. And I think of three major differences.

The first is that in 1964 there was only one road into the entire Brazilian Amazon. The access otherwise is via rivers or air strips. Today, of course, there is the entire TransAmazon Highway System. There is the Carajas railroad. And in the same period of time the population in the Brazilian Amazon has gone from 2 million, roughly equivalent to what was then thought to be the original indigenous population of the Brazilian Amazon, to 17 million.

Mr. TORRICELLI. Are you including the indigenous figures in those?

Mr. LOVEJOY. I am including the indigenous figures in that.

Toward the end of this period, of course, we saw the great deforestation and burning toward the end of the 1980's. That has now dropped to a rate estimated at something on the order of 11,000 square kilometers a year, about half of what it was at its peak. That is a sign of progress, but the number is still big. And I would assert that as long as those 17 million do not have reasonable ways to support themselves without destroying the forest, it will be hard to reduce that destruction of the Amazon forest much further.

So I guess I have two general prescriptions of what needs to be done. The first is simply that no more access points, no more roads, should be built into the Brazilian Amazon until such time as there is greater presence of government on the land and ability to control spontaneous colonization, or until the technically very fine economic and ecologic zoning, which the Brazilian Government has been pursuing for the Amazon, is actually implemented.

Mr. TORRICELLI. Are there other main roads that are, in fact, either under construction or now contemplated other than the small local roads that we might expect?

Mr. LOVEJOY. There is very little at the moment, but sort of lurking in the background are ideas that have been there for years of links to Peru and other parts of the TransAmazon Highway System along the northern part of the basin to protect the border.

Mr. TORRICELLI. I will change the format here slightly for interest and efficiency. I will take advantage of the fact that I get to ask more questions. When I asked Mr. Lula da Silva about the hydroelectric programs, I was very encouraged by his response. There are 30 hydroelectric facilities that are envisioned. Is that not true?

Mr. LOVEJOY. That is true.

Mr. TORRICELLI. And only half a dozen have actually been built.

Mr. LOVEJOY. It is really a small number. I think it was maybe five.

Mr. TORRICELLI. Did you interpret his answer when he spoke disparagingly about the principal projects that he is referring to this generically as being an unsuccessful program or specifically to the one, Balbina?

Mr. LOVEJOY. I think, in fact, he was referring specifically to Balbina. But the Samuel dam in Rondonia is very similar to it.

Mr. TORRICELLI. So if in the body politic in Brazil, the Balbina one is considered generally as not to have been successful and a bit of a scandal, is that not painting impressions of the remainder of the 30 hydroelectric project programs?

Mr. LOVEJOY. Well, one hopes it does, but ideas keep returning. And eternal vigilance is what is needed there.

Mr. TORRICELLI. And the slowdown in land destruction, is this from changes in government policy or simply changing of internal economics?

Mr. LOVEJOY. It actually comes from a variety of factors, one of which is internal economics. Another one is changes in government incentives and subsidies.

Mr. TORRICELLI. When we were in Brazil you were not convinced that the subsidies have all been removed to the point that had previously been promised. Do you know whether now, in fact, some of the land title incentives and tax incentives remain?

Mr. LOVEJOY. I am not sure I can give you a good answer on that this afternoon. I think some of them do, but I would like to check into that.

Mr. TORRICELLI. Do you have somebody in the office who, in fact, could look or get information from the embassy and respond in your own view whether or not the incentives, which I understand are, first, different tax rates for whether or not the land has been cleared, and second a greater ability to get title to the land, whether or not it had been cleared; and third, I suppose, the subsidization through getting access to utilities whether or not it had been cleared, whether, in fact, those things still exist or whether they have been changed.

We probably should know that, as a matter of fact. I wish I had more time and had been able to ask Mr. da Silva about that.

Is there anything further that you wanted to add?

Mr. LOVEJOY. The only other thing I wanted to add is that the same time as the whole issue of access has to be kept under control, there still is the issue of the 17 million people there and how they are going to support themselves. And what we are really talking about is finding ways to essentially fix population in place with truly sustainable development. I see individual efforts here and there.

I see the promise of fish farming, of agroforestry, extractive reserves. Steve Schwartzman tells me some of the colonists have turned to agroforestry on their own, having seen the futility of some of the other approaches.

But then there is also the longer term, which is the whole issue of biochemical prospecting. Looking for ways to generate wealth at the level of the molecule from this extraordinary biodiversity.

Mr. TORRICELLI. There is also the argument, as you find creative and ingenious ways for people to sustain them, you are only encouraging the maintenance of populations which otherwise would better not be present.

Mr. LOVEJOY. Well, short of finding ways to move them out, it is better that they not destroy the forest. There are two points about that biochemical prospecting or at least one point, and that is once Brazil has resolved this intellectual property rights issue, which it is getting close to doing, Brazil is in an extraordinary position to pursue the whole exercise of biochemical prospecting all the way through to being an actual manufacturer of a particular drug or whatever the product may be. And more than any other tropical country, it has the capacity for vertical integration. So it is something that we should look for ways to encourage.

Lastly, as I was sitting listening to the testimony and thinking about the sustainable development issue in the Amazon, it really comes back to the biological resources there. Every example that I came up with turned out to be biologically based, so the solution, in fact, is in the very biodiversity that is being destroyed.

Mr. TORRICELLI. The efforts by pharmaceutical companies to, in fact, categorize findings in native cultures or indeed to seek out in the organisms and the plants in the Amazon pharmaceutical breakthroughs, is this in your judgment largely anecdotal at this point, or are there many sustained efforts by many companies, and are

they really impaired by the legal difficulties in Brazil or has there just not been the will to pursue it aggressively?

Mr. LOVEJOY. In Brazil itself there has not been a great deal of this partly because of the property rights issue. But elsewhere it certainly has been much more sustained, and I think Professor Balée can help us understand it in far greater detail.

[The prepared statement of Mr. Lovejoy appears in the appendix.]

Mr. TORRICELLI. Dr. Tucker, welcome to the subcommittee. Along with Dr. Skole, we welcome you both to the subcommittee. Dr. Tucker, I understand you are presenting the testimony.

STATEMENT OF COMPTON TUCKER, NASA, ACCOMPANIED BY DAVID L. SKOLE, UNIVERSITY OF NEW HAMPSHIRE

Mr. TUCKER. Thank you. What I will do is give you a brief overview, 1 or 2 minutes, and then Dr. Skole will present our results on the reforestation in the Amazon in a very succinct fashion as well. In NASA in the past 3 or 4 years we have had a problem, which Dr. Skole and myself have been two of the executors actually doing the work ourselves with our coworkers using Landsat satellite data to study tropical deforestation not only in South America, but in Africa and Southeast Asia.

We will be reporting and have provided recently to President Clinton on the Committee on the Amazon and Brazil, which has come to fruition in the past 2 or 3 years and is being updated using Landsat data from the 1990's. In NASA, this interest grew to study tropical deforestation for two reasons.

First, and the paramount reason is it look at tropical deforestation as it related to biological diversity questions and specifically to the loss of biological diversity through deforestation. And, second, to look at the deforestation per se as this contributes to a release of greenhouse gases from deforested areas to the atmosphere and there has been a great deal of uncertainty about this. And this improves our understanding of the greenhouse gas situation.

As I mentioned, we have used Landsat data from the 1970's from the 1980's and now from the 1990's to study this problem.

The work is going very well. And now Dr. David Skole will show some examples. It is the type of work which most interested lay people, after a few minutes of instruction, can grasp very easily and I will turn the program over to Dr. Skole.

In the interest of brevity, he can describe some of our results. Anyone who is interested is encouraged to read in more detail our more ponderous findings and an article from *BioScience* as well as an article from *Science* 6 months ago. Thank you very much.

[The prepared statement of Mr. Tucker appears in the appendix.]

Mr. TORRICELLI. Thank you.

Mr. SKOLE. Before I go further, let me amend what Dr. Tucker was saying in that this is actually the work of a project that is being funded jointly by several agencies, including the U.S. EPA and NASA, which I think is an amazing feat in and of itself.

I think 5 years ago it is safe to say that the rate of deforestation in the Brazilian Amazon was virtually unknown, and that although there were quite a lot of discussion in the popular literature in the

New York Times, in *Time* magazine and elsewhere, if you looked at the numbers, they ranged considerably.

For instance, one estimate on the low side was some 20,000 square kilometers per year ranging all the way to the high side of 80,000 square kilometers per year. And I think it was this paucity of precise data that actually made it very difficult to do anything about the deforestation process itself.

In other words, policies couldn't be implemented with this kind of uncertainty in just this simple aspect of the numbers.

About 2 years ago, Dr. Tucker, his colleagues and my colleagues at the University of New Hampshire, undertook a project to collect the Landsat data to actually do the measurements in very high resolution. The resolution of these satellites is something on the order of 100 meters or less, 100 yards or less in resolution, and thereby we can precisely quantify the extent of deforestation, the pattern of deforestation, and the rate of deforestation.

Let me, if I could, step up front and we could look at some of the imagery. These two scenes over here demonstrate the real use of the satellite data in the Amazon. This image was acquired in 1975 and this image was acquired in the same place about 10 years later in 1986.¹

Mr. TORRICELLI. Would you turn those slightly side ways so that I could see them.

Mr. SKOLE. Let me point out that the coloration is done through a computerized process such that the forest looks red and the deforested area looks blue and there is some technical reasons for that, but the reason is that the satellite sees in the infrared spectrum.

What you can see is the increase in deforestation in this region of Rondonia in that period. And as well, you can see that the deforested area highly fragmented the forest, such that there is still forest remaining in between these fish bone patterns of clearing, but they are highly fragmented and the impact on the habitat itself is significant.

Let me point out something about the dimensions. This is about 100 miles by 100 miles in its dimension so each scene covers a very large area. These clearings up in the upper right-hand clearing, these large fazendas or pastures that have been cut out of the forest are as large as the District of Columbia and they have about the same dimensions, in fact. So you get a sense of the scale of the process of deforestation as well as the scale at which this technology can be used in a region like the Amazon, which is 5 million square kilometers, as big as most of the United States. And really the only way to quantitatively access the rate of deforestation in an area this big is to use this kind of satellite remote sensing. And we have taken 250 scenes like this, merged them together in a computer and produce a map such as this one shown here and we have some enlargements that we can hand out, I think, as well so that you can look at those more closely, but this then provides a seamless data set for the whole of the Amazon where we can actu-

¹ Illustrations referred to in Dr. Skole's statement may be obtained through Complex Systems Research Center, Institute for the Study of Earth, Oceans, and Space, University of New Hampshire, Durham, New Hampshire 03824-3545.

ally see where the deforestation is going and assess the process that we have been talking about today.

I also want to point out in these scenes over here, they are fairly interesting, in particular the one in the middle here where you see an indigenous area here, in red, the forested area, being almost entirely circled by deforestation going on in the region. And, in fact, the road cuts through the center of it. So this question of demarcation is important as the process of encroachment in these areas is a very real one.

Let me just conclude by saying that now, having done the analysis, having done the measurements, we have a better idea of what the deforestation rate is and I think we know that unequivocally. The rate of deforestation is approximately 20,000 square kilometers a year.

[The prepared statement of Mr. Skole appears in the appendix.]

Mr. TORRICELLI. How do you compare that with the rate of abandonment of already cleared land?

Mr. SKOLE. We are just beginning to look at the rate of abandonment and it appears to be significant.

Mr. TORRICELLI. Is it possible that it is equal?

Mr. SKOLE. No, it is not equal. The total area deforested, in the Amazon, approximately one-third is in secondary growth, is in some stage of abandonment. The rate is more difficult to calculate and we haven't done those calculations yet, but we think—do know that one-third of the area is in secondary growth and this is emerging as a very interesting process.

Mr. TORRICELLI. What do you know about in that one-third that has been abandoned in soil depletion, what it does, recognizing the problems of biodiversity, but is the land left enough value that indeed it can grow back at natural rates?

Mr. LOVEJOY. It really depends on the actual history of what was done to the piece of land before it was abandoned. If it was treated relatively lightly, it will come back much more easily than if the very thin soil structure was disturbed. Also it depends on the size of the area. The bigger the clearing that is abandoned, the more slowly it will return toward something like normal. And then on top of all of that, very often these abandoned areas are then reinvaded and put to temporary agriculture again.

Mr. TORRICELLI. That I recognize. So that a third of it may be abandoned, but that doesn't mean that it is abandoned permanently. At some point people come back and use it for ranching or some other purpose.

Mr. SKOLE. That's correct. We have submitted for the record this paper that was just published this month in *BioScience* in which we explore those dynamic processes of clearing, abandonment, and reclearing of the land.

Mr. TORRICELLI. Is the reclearing by the same slash and burn techniques, so we have the same air quality problems of destruction?

Mr. SKOLE. Yes, the abandoned land has the potential to accumulate carbon dioxide out of the atmosphere, but when it is recleared, it is going to release carbon dioxide back into the atmosphere. So the question of the net storage of carbon and the emission of greenhouse gases is emerging as a very complex land use

problem when we study the Amazon basin and other regions for just those reasons.

I would like to just finish with making two points. The first being that we set out to do basic research primarily under NASA's Mission to Planet Earth Program and EPA's Global Change Program, but in the process I think we found that global change-type research, basic research, can also have positive social and economic benefits for policy and land management and environmental management questions. Particularly, when you use these kinds of technologies.

The second point is that we are beginning to understand that the causes of the deforestation process are more complex than we thought, and that, in fact, it is not simply a question of too many people or population growth or population problem. It does, indeed, as was mentioned today, have to do with international forces of trade and debt and lending and development policies in an international context. So I think that the United States has a very—

Mr. TORRICELLI. I heard Mr. Lula da Silva say that. Perhaps you could help me understand what I didn't at the time. I understand the debt crisis driving people to try to have an export as much as possible to gain foreign exchange, which causes living standards to be lower so that people may leave and seek more opportunities. Is there something more than that that I am missing in the connection between the debt crisis and the destruction of the Amazon; a specific policy that is pursued as a consequence?

Mr. SKOLE. The answer is, yes, and in this paper in *BioScience* we elaborate the complex chain of events that I will try to simplify. It is this one here that everyone should have a copy of.

Mr. TORRICELLI. Everyone but me.

Mr. SKOLE. But if you look at the explosive rates of deforestation in the late 1970's and mid-1980's in Brazil, you can see it was tied to foreign lending for agricultural modernization programs in the south of Brazil in the State of Parana where coffee and small farmer programs were converted.

Mr. TORRICELLI. It was international lending that was used for the development of these large plantations, but the maintenance of the debt itself is not generating further Amazon destruction. It was the unfortunate use of the money that was borrowed initially.

Mr. SKOLE. Well, the money was used to encourage soybean production for export. And those kinds of systems are highly mechanized. They are very large. And farm consolidation displaces people. And, indeed, many of the people went to Sao Paulo and Rio, but others went into the Amazon into the new frontier.

Mr. TORRICELLI. In your judgment, this issue about the international lending institutions and some of the egregious errors of judgment in the past both for previous hydroelectric projects, road construction, things that led to both environmental instruction, and the abuse of the indigenous peoples, are these international institutions now largely under control in these practices?

Mr. LOVEJOY. I think it was fair to say that they were so badly burned that they are doing almost nothing in the Amazon. The description of the land use changes is very true. And there were all those small landholders who went to the Amazon seeking their fortune, at the same time as the economic prospects in Brazil wors-

ened and they had to worry about meeting IMF requirements. You can imagine that the first programs that got cut in government spending were the long-term programs like farm extension personnel and the rest.

Mr. TORRICELLI. Are there any of these international institutions that still concern you as not recognizing the potential damage they do?

Mr. LOVEJOY. I think the Inter-American Development Bank and the World Bank are both very good about this right now. And, in fact, if anything, the problem is how to get them to go beyond just the G-7 payment project and really think about constructive things they might do.

Mr. TORRICELLI. Do you, in your office, tend to monitor their agenda?

Mr. LOVEJOY. Without any effort it all comes to my attention. If I may be permitted a remark relative to Lula's flight of rhetoric about if the Amazon are the lungs of the world and the debt is pneumonia, it seems to me that debt swap can be some medicine for the pneumonia.

Mr. TORRICELLI. We can keep this metaphor going forever. Doctor, anything else to add? Thank you very much. It was indeed very helpful and I do have your paper now which we will submit in the record at the conclusion of your testimony.

[The information appears in the appendix.]

Mr. TORRICELLI. And Dr. Balée if you would proceed.

**STATEMENT OF WILLIAM BALÉE, PROFESSOR,
ETHNOBOTANIST, DEPARTMENT OF ANTHROPOLOGY,
TULANE UNIVERSITY**

Mr. BALÉE. Thank you, Mr. Chairman for holding this important hearing on indigenous people and the natural environment in Brazil. I would like to focus today on the current and past relationship between Brazilian Indians and the natural environment with specific reference to the area that I know best, which is called pre-Amazonia, the extreme eastern part of the Brazilian Amazon in the state of Maranhão, and I would like to, if I may, use the overhead projector to show you this area and say a few words about it.

Well, we can't see this very well, but the most important outlines at least, I think, are visible. Pre-Amazonia is drained by the Gurupi River, which drains directly into the Atlantic Ocean. This forested area is about 6,500 square miles in extent today. The forested part was larger in the past.

The indigenous peoples of pre-Amazonia include the Ka'apor, Awa-Guajá, Tembé, and Timbira, all of whom have occupied the region since prior to the 20th century. What you see visible here are some of the current indigenous reserves and the northern part of the biological part of the reserve down there on the bottom, which had been established by the Federal Government of Brazil over the years.

Mr. TORRICELLI. Can you place this as to where this is geographically for me?

Mr. BALÉE. Yes, it is about 150 miles inland from the Atlantic Ocean, in the extreme east of the Amazon, south of the Amazon

River proper. I have a scale to show you. There it is in Brazil, the black square.

The flora of pre-Amazonia consists of at least 1,000 species of vascular plants, the great majority of which are trees. The Ka'apor, Guajá, and Tembé peoples, whose ethnobotany I have studied, use about 90 percent of these plant species in the pre-Amazonian region in one way or other. In addition, a certain portion of the forest has been altered in its species composition by agroforestry practices of the indigenous peoples, such as ancestors of the Ka'apor and Tembé, over perhaps hundreds of years.

Such alterations of forests do not apply to the Guajá who are among the last hunting and forging nomads in the world. The Guajá do not burn forest for agriculture for traditionally they had no agriculture. Many of them still do not.

I would like to show you a second image. This transparency shows that in an inventory of 8 hectares of forest, 4 of which were high forest or primary forest and 4 of which were old fallow, which is a kind of forest created by the Indians themselves over hundreds of years, the species/area curves between the two different forest types are insignificantly different.

The number of species is insignificantly different between the two forest types, yet the species composition of the two different kinds of forests are extremely different. This indicates an indigenous contribution to regional biodiversity, insofar as some of these species in the old fallow would not exist if it were not for indigenous agroforestry practices of the past and present. The old fallow forest is usually coded as high forest in maps and in satellite imagery.

This third transparency shows you the eastern edge of one of the indigenous reserves of pre-Amazonia from a satellite image taken in July 1990, and unlike Professor Skole's image, green here is forest. And the reddish or pink areas are deforested. The line separating forest from nonforest is the eastern edge of upper Turiaçu Indian reserve in July 1990. An extraordinary contrast is to be found in pre-Amazonia and this image in part tells that story.

Where there are no Indians, there is also no forest left. And where there are areas where there are Indians, there still is forest. This area has about 750 indigenous inhabitants. In the upper left-hand corner you see the Gurupi River.

Mr. TORRICELLI. What is it that you learn about the size of the reserve being large enough to maintain both the amount of land and the number of species to be able to maintain the indigenous tribe?

Mr. BALÉE. I think that the long-term history of the area shows that it is possible that indigenous peoples and regional biodiversity are not incompatible, given that they have occupied the area prior to the 20th century and have also practiced agriculture in the area.

Mr. TORRICELLI. In the lands that remain, the biodiversity appears stable and consistent with what it would have been if the other lands had not been developed?

Mr. BALÉE. I don't know how to answer that question at this point. We don't have research on that particular—

Mr. TORRICELLI. You cannot be certain that there is a zero impact on the way of life of the indigenous tribes because of the maintenance of these lands?

Mr. BALÉE. I am not sure I understand the question. The maintenance of the lands of the Indians?

Mr. TORRICELLI. That the way they hunt and gather, their diet, their other means of life, would not have been different if the adjoining lands had not been developed. Meaning that this reserve—

Mr. BALÉE. It is unlikely that their way of life would have been substantially different. However, at this point 4 years later, this area in this portion here, which forms the southern part of the reserve exhibits pink dots. Those pink dots are illegal cattle ranches that began to be built into the area after 1989. If we were to have a satellite image of the same area 4 years later, it showed a much larger swath of destruction, perhaps as much as 20 percent of the entire reserve.

Mr. TORRICELLI. That does not answer the question I am asking. The question is to raise an analogy, if we had preserved all of South Dakota as a reserve for Native Americans, the traditional way of life still would have been interrupted because the buffalo needed to migrate into Nebraska. So given the whole State, it wouldn't have had any impact on an important part of the their culture and their food.

My question here is the same. It is tremendous this land has been preserved, but what does it do about the species that they rely upon, given migration and the amount of land they might require for natural habitat? Has something really been accomplished by preservation of this amount of land?

Mr. BALÉE. Something has been accomplished because the indigenous cultures are still extant there. However, if this land, which is demarcated, is not protected from illegal invasion, plant and animal species endemic to the area will be obviously lost with the destruction of this area. In addition, it is the last substantial block of forest east of the Tocantins River, which is about 300 miles west of the Atlantic Ocean, that could be used as a seed bank for future reforestation projects in eastern Amazonia and in the area of the Pleistocene forest fragment known as the Belém refuge, which is outside of this area to the West, which has been almost totally deforested by cattle and ranching interests and, which has no—on paper at least—legal protection, as does this area.

In conclusion, I would ask today what stands to be lost with the current illegal deforestation of pre-Amazonia? One can perceive at least five major losses.

First, loss of human life is imminent, both of Indians and non-Indians who are entering into direct, violent, armed conflict with each other over this land.

Second, indigenous knowledge of the uses of the plant species will soon vanish. Some of this knowledge could have universal, sustainable applications as new food crops, medicines, textiles and fuels. Without the forest, indigenous knowledge of pre-Amazonian plants and indigenous culture itself, which is inextricably tied to the existence of the forest, would certainly perish.

Third, the imminent total destruction of pre-Amazonia would cause plant and animal species endemic to the region to go extinct and nonendemic species to go locally extinct.

Fourth, because it is the last substantially intact as well as legally protected area east of the Tocantins River, the destruction of pre-Amazonia will eliminate the most important potential seed bank for any possible reforestation projects in the region, given that its biological conditions are similar to the rest of that area.

And fifth, the different but highly successful and environmentally enhancing modes of land use—indigenous agroforestry in eastern Amazonia and foraging (or hunting and gathering) stand to be forever destroyed by the illegal invasion and destruction of what remains of pre-Amazonia.

Mr. TORRICELLI. Do you know when these illegal cattle ranches first appeared?

Mr. BALÉE. Yes. They began in about 1989.

Mr. TORRICELLI. Do you know whether indeed it has gotten worse since then?

Mr. BALÉE. Yes, we know that it is much worse and there are approximately 1,000 nonindigenous intruders within the confines of the reserve, as indicated in the prepared statement that I submitted.

Mr. TORRICELLI. Do you have any idea whether they are being challenged by the Brazilian Government at all?

Mr. BALÉE. At this point, the Brazilian Government is not removing the intruders.

Mr. TORRICELLI. Thank you very much.

Mr. BALÉE. Thank you.

[The prepared statement of Mr. Balée appears in the appendix.]

Mr. LOVEJOY. I would just like to say that this area is probably the single most important conservation priority in the Brazilian Amazon. I mean, it is the last place where a whole variety of species are surviving, and as you see, it is being eaten away. So if we ever—

Mr. TORRICELLI. Is it the same kind of local government problem as we saw in Manaus where the local political dynamics are simply to support development and will never interfere?

Mr. LOVEJOY. I mean, it is just very weak. There are people in the State of Maranhao who would like to do something, but if we ever got a debt swap program going with Brazil, this should be the first thing we would put on the list for the Amazon.

Mr. TORRICELLI. Has this reached the point of being before Brazilian courts, or local governments haven't even allowed it to go forward in the judicial process?

Mr. LOVEJOY. It will be messy with titles and stuff like that, but with resources you could do something about it.

Mr. TORRICELLI. In area of designation, is it similar as the way the Yanomami lands were designated by the Venezuelan-Guyanese border; the same kind of legal format designations?

Mr. LOVEJOY. This is a much older one. I simply don't know the details of it. The most of the land is Indian land and not too much of the remaining forest is of any consequence.

Mr. TORRICELLI. Your testimony today has been very helpful. I appreciate that it has taken so long, but it, indeed, is very useful

to establish this record; useful for my own knowledge as we go forward. I hope that in each of your cases this is not the last time you communicate with the subcommittee. This is an ongoing issue of continuing interest to the subcommittee and each of your research, the things that you discover, the things that you write, the visits you have, I hope you share those with us as the years go forward so we can benefit from your work on an ongoing basis.

Thank you very much for your cooperation. The hearing is adjourned.

[Whereupon, at 4:40 p.m., the subcommittee was adjourned.]

APPENDIX

OPENING STATEMENT BY CHAIRMAN ROBERT G. TORRICELLI THE NATURAL ENVIRONMENT AND INDIGENOUS PEOPLES OF BRAZIL SUBCOMMITTEE ON WESTERN HEMISPHERE AFFAIRS

May 10, 1994

Last August, on the occasion of the tragic massacre of 16 Yanomami Indians by gold miners, Senator Jarbas Passarinho of Brazil wrote that "What happened in the United States during the gold rush was repeated, without the escapades of General Custer, in Roraima."

His parallel speaks to a primary purpose of today's hearing. The slaughter of indigenous peoples in the United States is one of the most shameful chapters of our history, but it is one that we cannot forget. Indeed, one of the best ways that we can attempt to make amends for our gross mistreatment of indigenous peoples is to give advice to other nations who are today facing the same difficult problems that we faced in the 19th century.

Today in Brazil, the survival of 200 societies of indigenous peoples is at issue. For most of these societies, their survival and their capability to maintain their cultural integrity is intimately connected with their control over their natural resources. Tragically, those resources are being sought aggressively and often violently by mining and other interests, many of whom will stop at nothing to gain access to indigenous lands.

Last year, 16 Yanomami Indians were murdered in cold blood because wildcat miners wanted the gold under Yanomami land. The Guarani, after seeing their territory drastically reduced, and their attempts at preserving their Constitutionally guaranteed right to own land negated by the courts, are committing suicide. These and other indigenous groups ask nothing from the government other than the right to remain on their traditional lands. But because of the material value of those lands, their requests are being denied.

This is a tragedy not only from a human rights perspective, but also from an environmental perspective. The land rights of many of Brazil's indigenous peoples coincide with some of the greatest remaining concentrations of biological diversity on the planet. Already, as we can see

from the satellite photos displayed around this room, the amount of deforestation that has taken place in the Amazon is devastating. What we cannot see are some of the other horrible environmental consequences of the exploitation of natural resources, such as the spread of large quantities of highly toxic mercury throughout the Amazon as a result of uncontrolled mining processes.

Today, we have called together representatives from the Clinton Administration, leaders of two Brazilian indigenous nations, and Brazilian presidential candidate Luis Inacio Lula da Silva to discuss ways in which the Brazilian government can best protect their indigenous peoples and the Amazon, and ways in which the United States can be of assistance. We will also hear from several prominent members of our scientific community, who will discuss the ecological impact of what is going on in Brazil.

There are several important messages that we can send to the Government of Brazil with today's hearing. The first is that judicial impunity for the perpetrators of violence, especially in land conflicts, creates a climate where law enforcement becomes virtually impossible. The predicted escape of the assassins of the late leader of the rubber tappers' union, Chico Mendes, and the failure to apprehend or try any of the persons responsible for last year's Yanomami massacre, are only two tragic examples of judicial impunity in Brazil. If the judicial system cannot protect the most basic of human rights, no real development can occur. The United States must find means to support appropriate Brazilian initiatives for judicial reform, for training -- for whatever is necessary to bring about the rule of law.

We must also convince Brazil to consider protection of its tropical forests as a more appropriate and lucrative policy than destruction of those forests. The biodiversity of the Amazon -- the largest remaining expanse of tropical forest in the world -- may well contain information and material critical to new generations of products in the fields of biotechnology and genetic engineering, with inestimable value to the planet. Protection of biological diversity and its appropriate use can become a source of enormous wealth for Brazil.

President Clinton and Vice President Gore believe that economic growth and development can and should be compatible with environmental protection, as well as with the defense of human rights. I hope that they will heed the discussion of these issues here today, as they proceed in preparing for the Summit of the Americas to be held in Miami in December of this year.

I also intend to use this hearing as a springboard for legislation. The American market for timber products has stimulated deforestation around the world. I believe that by making American consumers aware of where timber products originated, we can decrease the demand for products that come from the Amazon and other threatened areas. I am also analyzing the 1940 Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere to see if by revitalizing the Convention, we can include an amendment that would require each signatory to protect its people and natural environment from toxic mercury poisoning.

Once again, I welcome our distinguished Brazilian and American guests and I look forward to your testimony.

THE AMAZON: PRESENT AND FUTURE

TESTIMONY BEFORE

THE UNITED STATES HOUSE FOREIGN AFFAIRS COMMITTEE

WESTERN HEMISPHERE AFFAIRS SUBCOMMITTEE

LUIZ INÁCIO LULA DASILVA

1:00 P.M. MAY 10, 1994

THE AMAZON: PRESENT AND FUTURE

Testimony Before The United States House Foreign Affairs
Committee, Western Hemisphere Affairs Subcommittee
by Luiz Inácio Lula DaSilva
1:00 p.m. May 10, 1994

Members of the Subcommittee, visitors and guests:

I am happy to be here in the United States to discuss a topic of such importance to the future of humanity. I also wish to express my thanks for the invitation to express our point of view on the current situation and the future of the Amazon.

The environment cannot be separated from the economic, political, social, cultural and ethical issues which I would like to address. And the international situation today is changing dramatically.

The changes are not only geopolitical, with the crisis in Eastern Europe and the end of the Soviet Union. They are much more of an economic and social nature.

The disturbing signs of financial instability are growing in the developed countries and the economic crisis deepens in the peripheral economies, especially in Latin America. My country, Brazil, has been living between stagnation and hyperinflation for twelve years.

Some of the countries on this continent, which are applying tough "economic adjustment" programs, can commemorate some success in the control of inflation, but none show any improvement in their social situation. We see growing unemployment, poverty and misery throughout Latin America.

Our precarious systems of education, health and welfare are coming undone. Epidemics such as cholera are returning, bringing death to thousands of the poorest. Millions of youth and children are deep in despair, when not abandoned to the streets, prostitution or violent crime.

And for all these reasons, I want to warn, from this tribune, that the KEY THREATENED SPECIES IN OUR COUNTRIES -- AND ESPECIALLY IN BRAZIL -- IS THE HUMAN BEING.

This silent genocide has its economic causes which are also the basis for our countries' environmental degradation. One of these causes is the Foreign Debt, which we have paid many times over and which is growing each day. One of these causes is the deterioration of our foreign trade, as the rich countries impose the end to our protective tariffs, while they openly practice protectionism, as is made patently clear by the continuing trade impasse with Japan. One of these causes is the bargain selling of our industry, condemned to strangulation in the face of the neo-liberal offensive and outdated technology, which every day separates us more from the developed world.

But there are political reasons too. Some governments try to reduce the planet's environmental issues to preserving the forest, especially the Amazon. As Brazilians, with indisputable sovereignty over most of the Amazon, we are pleased by the growing interest of developed countries in saving the Amazon forest. But we require that rich countries be equally concerned with air pollution, the destruction of the ozone layer, and other forms of pollution that continue in their territories.

We are open to international cooperation on the environment and vehemently reject the false nationalist rhetoric of Latin American elites and governments which raise the phantom of external intervention as a pretext to continue the criminally predatory policy which has produced such gigantic devastation.

We therefore require that this cooperation be founded on the basic principles of respect for the sovereignty of the Amazonian nations over the forest, as well as on the co-responsibility of the rich nations for other environmental imbalances which hurt the human condition in the region: lack of basic sanitation, lack of sewage systems, precarious educational systems, workers permanently subject to unhealthy and unsafe environments and salaries of hunger.

With this introduction, I can focus my analysis on the problems of the Amazon.

In Brazil, following the 1989 presidential elections, we created a Shadow Cabinet ("parallel government") to articulate the democratic opposition, and express the opinion of the 31 million voters who supported us in the second round of that contest. Its basic purpose was to monitor the policies of the present government and formulate alternate proposals for the country, from the point of view of the exploited and marginalized majorities.

Now we have created a Plan of Government, which outlines very specific steps to be taken in each major environmental region in Brazil.

We are now making the complete document available to all.

The Amazon has been presented to the world for decades as a homogeneous, unpopulated and monotonous region, without physical and biological diversity. A space without people or history, to be manipulated by plans made from afar.

The governing elites offered the region public policies which resulted in enormous failures. There have been recognized policy failures regarding the Indians, land ownership, agriculture, transportation, mining and hydroelectric power. Moreover, there is a deep disregard for the destiny of the traditional peoples, dependent upon the forests and streams: Indians, rubber tappers, brazil nut harvesters and river dwellers.

Road construction in the heart of the jungle, without anticipating its physical, environmental and social impacts, has led to devastation on many fronts. There has been criminal omission in protecting the water quality of the rivers and streams, which provide fish -- the key food and basis for survival of the region's peoples.

For many years, there have been unbalanced incentives for large and small mining, with no concern for the consequences. The invasion of indigenous reserves by miners is far from being resolved.

These facts demonstrate that the opening of the Amazon to the outside world -- under the force of truly savage strategies -- has caused the emergence of one of the most unequal societies known today based on the exploitation of natural resources.

This invasion has brought about the chaotic use of land, the pillage of basic natural resources and underground riches, leading to total ecological disorder. This ecological and social disorder has reached levels that have caused both the deterioration of the environment and acute social conflicts: The two most serious environmental problems of the Brazilian Amazon.

After three decades of interference in the region, a new atmosphere of living together in understanding can no longer be postponed. The current situation of social injustice and ecological aggression, due to the elitism and incompetence of a succession of governments, must be radically changed.

Living in the Brazilian Amazon are 150,000 Indians, 2,500,000 rubber tappers, river dwellers, islanders and nut collectors, 560,000 miners, and 5,000,000 laborers, government employees and itinerant workers, as well as several million urban inhabitants spread among the large, medium and small cities.

This human contingent should be the center of attention of any environmental proposal for the Amazon, especially the policy to be undertaken by an administration far more responsible than the present government. It should follow democratic and popular concepts, and its values of ecologically balanced development and social justice.

In broad strokes, our global project to develop the Amazon, with a maximum of the forest standing, consists of the following basic guidelines:

1. Introduce a policy of peaceful co-habitation among the different communities and cultures, to stop the unending, violent conflicts between ranchers and Indians, large landowners and squatters, miners and Indians, Indians and ranch hands, rubber tappers and loggers.
2. Support a broad process to rehabilitate biodiversity, given its importance to the country and the planet, as genetic heritage and a reserve for pharmaceutical and medical research, as well as the basis for the peoples' self-sustaining economic activities: edible palm and oil products (agai, pupunha, palm oil) and shaded crops at the edge of the forest (cacao, fruit trees).

3. Arrest the irresponsible policy of opening roads, underway since Brasilia was built, with more and more corridors of devastation, which has already produced irreparable losses to the Amazon environment. Halt authorizations to build new roads until a new system is put in place to manage the existing roads, designed to preserve the environment and achieve real support for local communities and travellers.

4. Change legislation which authorizes deforestation up to 50% of any land holding, regardless of the type of soil or time frame, ending the fraud that considers any clearing as an "improvement." Rigidly control all activities based upon land clearing (logging, grazing, mining, etc.), limiting existing large landholdings to cut 0.5% of the total area.

With these steps, we are very confident we can stop the deterioration of the environment and bring about positive change.

STATEMENT OF JOHN SHATTUCK
ASSISTANT SECRETARY OF STATE
BUREAU OF DEMOCRACY, HUMAN RIGHTS AND
LABOR
DEPARTMENT OF STATE

BEFORE THE
SUBCOMMITTEE ON WESTERN HEMISPHERE AFFAIRS
COMMITTEE ON FOREIGN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.

ON
THE RIGHTS OF THE INDIGENOUS IN BRAZIL

MAY 10, 1994

Mr. Chairman, I would like to thank you for the opportunity to appear before you today, and commend you for your strong interest in the protection of individual rights for indigenous people and in environmental protection.

As you know, the Clinton Administration is deeply committed to the promotion and protection of individual human rights, both at home and abroad. And indigenous people are often subjected to serious abuse and often lack the means of ensuring that their governments recognize and protect their individual rights.

This administration is working to raise the profile of indigenous people in the human rights arena. This year, we have introduced a new section in our Country Reports on Human Rights Practices, focusing solely on abuses of the rights of indigenous people.

The U.S. is also monitoring the progress of the draft United Nations Declaration on the Rights of Indigenous People. Currently the declaration is being reviewed by the UN's Subcommission on the Prevention of Discrimination and Protection of Minorities.

We strongly support the Declaration's basic goals: (1) that persons belonging to indigenous groups are entitled to exercise fully their individual human rights without discrimination, and (2) that indigenous persons have the right to preserve their identity and culture, free from involuntary assimilation.

In addition, at this year's session of the United Nations Human Rights Commission in Geneva, we joined consensus on several resolutions addressing the rights of indigenous people.

There is much that needs to be done in this area. The individual rights of many groups of indigenous people in many countries are not being protected adequately by their governments. Although this is a worldwide problem, a striking example is the plight of the Yanomami people of Brazil.

The cultural survival of Brazil's indigenous people depends on their ability to retain their own land. Environmental destruction, disease, and delays in land demarcation threaten their future.

Every Brazilian state has "reservas indigenas." The Yanomami reserve, the largest, is in the Amazon Basin. Approximately 300,000 indigenous people live in this area where they frequently suffer discrimination and depredations by outsiders.

Last summer a massacre of 16-18 Yanomami people took place along the border between Venezuela and Brazil. Immediately following reports of the massacre the State Department urged that both governments take swift and thorough legal action to bring the perpetrators to justice. I met with informed NGOs to learn more about the situation, and subsequently with the Brazilian Ambassador to express our concerns. The Brazilian Government investigated the case and brought charges of genocide against 23 miners. Only two were arrested, however, and they were later released because witnesses could not be located. The case remains open, but prosecutors have had difficulty locating witnesses and the other miners accused of the massacre have never been found.

Responsible agencies in Brazil often have not effective action in response to the invasion of indigenous lands by outsiders. Although the 1988 Brazilian Constitution guarantees Indians' rights to traditionally occupied lands, the government has been slow to proceed with the demarcation of indigenous lands. Justice Ministry officials point to conflicting legal claims, requiring compensation for landowners holding deeds acquired in good faith, and the lack of funds for compensation as one problem. Current budget constraints make it difficult to find funds for the costs of physical demarcation. Political obstacles also exist: the military is said to object to indigenous lands along Brazil's borders and state politicians reportedly believe their economies will suffer if large contiguous areas are reserved for small Indian populations.

The Inter-American Commission on Human Rights has requested permission for an on-site investigation into the situation of the Yanomami. Brazil has so far not granted permission, but we would urge the government to grant this request. Many Brazilian NGOs are now promoting the rights of indigenous people and we have urged the Brazilian government to work with them.

Indigenous people in Brazil are in a poor position to protect themselves; few speak Portuguese and educational opportunities are scarce. One encouraging note is that proposed constitutional revisions that would have had a negative effect on indigenous rights have not been enacted by the Brazilian Congress, leaving the 1988 Constitution's pro-Indian rights intact. Nevertheless, law enforcement in Brazil for the protection of rights of the indigenous continues to be inadequate.

The rights of the indigenous in Brazil and their environment also are affected by the invasion of their lands by loggers, squatters and gold miners. Loggers cut down tropical hardwoods such as mahogany for commercial timber sales in contravention of the 1965 forestry code, which forbids

exploitation of resources on indigenous lands. Logging has eroded the physical and economic base of indigenous groups. The large sums of money being made in logging on the reserves almost exclusively benefit non-indigenous investors and speculators.

The roads which are developed for logging contribute to the destruction of the forest ecosystem and facilitate the movement of outsiders and disease to the Indians. Since a gold rush began in the Yanomami area in 1987, ten percent of the Yanomami population reportedly has succumbed to diseases to which they had no resistance, including malaria, tuberculosis, influenza, sexually transmitted diseases, and even the common cold.

Messy gold mining practices have also wrought environmental damage. The use of mercury to separate the gold from other ore has resulted in extensive mercury poisoning. Although the extent of such poisoning is not well documented, there is clearly an impact on the Yanomamis, who drink from and fish in mercury-polluted rivers, thereby absorbing dangerous levels of mercury.

The U.S. is working on a variety of fronts that we hope will improve the plight of the Yanomami. Many of the steps we are taking have been formulated in response to, and in conjunction with, the NGO community.

For example, the U.S., in cooperation with the G-7 and the Brazilian Government, is actively participating in the Pilot Program for the Conservation of the Brazilian Rain Forest, administered by the World Bank. It is a \$250 million program to promote conservation in the Amazon. In a recent international meeting on this program, the Government of Brazil made a commitment to better control activities of small scale gold miners who, up to this time, have encroached on indigenous reserves.

The U.S. Government has provided \$5.5 million as a contribution to the program. USAID's associated bilateral projects, in rain forest preservation and water clean-up, are complementary to this program. Existing program components include research, demonstration projects, demarcation of indigenous reserves, planning for forest research management, and environmental monitoring and surveillance. We hope we will be able to continue to support the Pilot Program in the future, given the tremendous significance of to indigenous people in the region.

In conclusion, Mr. Chairman, this Administration is concerned about the plight of indigenous people at home and abroad. We are committed to protecting their individual human rights and we will strive to prevent the extinction of their cultures by forced assimilation.

Thank you.



May 10, 1994

Statement of

Stephan Schwartzman, senior scientist, EDF,

on behalf of:

the Environmental Defense Fund, National Wildlife Federation

and the Sierra Club

regarding

The Indigenous Peoples and

the Natural Environment of Brazil

before

the Subcommittee on

Western Hemisphere Affairs,

Committee on Foreign Affairs

United States House of Representatives

Mr. Chairman, I am Stephan Schwartzman, and I am testifying today on behalf of the Environmental Defense Fund, the National Wildlife Federation, and the Sierra Club. These national environmental organizations together have more than 6 million members. I thank you for the opportunity to address this subcommittee.

It is an honor to be on this panel with Davi Kopenawa Yanomami and Marta Guarani. Many of the members of the organizations on whose behalf I am testifying will be very pleased to know that you have invited these respected indigenous leaders here today, so that the Congress can inform itself directly on the situation of indigenous peoples in Brazil. You have also made a particularly important contribution to a better informed and broader dialogue between the US and Brazil by calling one of Brazil's most important political leaders to speak today, Luis Inacio Lula da Silva.

Mr. Chairman, we endorse your view of the connections between indigenous peoples rights, human rights, and the environment. I'd like to discuss some areas where the Congress and this subcommittee can take positive action in these areas. You will hear from Davi Yanomami and Marta Guarani, about specific, urgent, situations--invasions of indigenous lands, flagrant human rights abuses, virtually unbelievable miscarriages of justice--where your (and your colleagues') direct expressions of concern to the appropriate authorities

can make an important difference, and we urge you to attend to these requests. We believe that you have taken an important step in calling on Mr. Shattuck to testify on these issues, and ensuring that our Department of State gives these concerns due attention and priority is another important step.

This hearing is an important contribution to the international dialogue on these issues, but it is only a beginning. Many policy makers in Latin America have very little accurate information about North American Indians and Alaska Natives, and at root suspect that if they ignore indigenous people long enough they will go away. They need to understand that here in the largest industrial nation in the world, the Indians have not gone away, and their problems continue to be national problems. They need to understand that the US has paid a very high price, in human suffering, in public funds, in wasted human resources, for our policy failures. The upcoming Summit of the Americas is an excellent opportunity for our government, not to lecture Latin America, but to demonstrate the importance we place on the issue by inviting representatives of US Indian nations to explain their situation. How, after all, can we address economic development in the hemisphere without addressing the state of the 40 million poorest people in the hemisphere? How can we discuss good governance without talking with those with least political representation? How can we act to stop the loss of biodiversity--probably the

most important environmental issue in our hemisphere today--without talking to those whose land everywhere coincides with the remaining repositories of biological diversity? If the US is to be a leader on indigenous peoples rights in the hemisphere, we must set the example of participation and frank discussion here. The recent White House meeting with American Indian and Alaska Native leaders, and the subsequent Listening Conference, were important benchmarks. Perhaps this subcommittee can see that this kind of attention to indigenous peoples' concerns is reflected in the agenda for the Summit of the Americas.

Mr. Chairman, you will hear from Davi Yanomami and Marta Guarani about the effects of gold mining and other environmentally destructive land uses in their areas. I want to touch briefly on the timber trade, because this is an area where both our consumption, and our example, have direct effects on deforestation world-wide. EDF will soon be releasing a report on timber consumption in the US and global deforestation, which discusses some of the ways that our enormous market for forest products can begin to create incentives for sustainability instead of for destruction. In the Amazon, in Canada, in Indonesia, as well as here in the United States, the timber trade is on the cutting edge of devastation. It is opening up the last remaining forested areas of the world to destruction, and it is a textbook case of unsustainable development, in which a few private actors benefit at enormous

public, and environmental, cost. We can begin to do something about this, first of all by moving to make timber production sustainable in the US, but also by giving consumers the information they need to create incentives in the market for sustainability. Our report will show that there is great consumer demand for such information, as well as great interest among retailers. People and businesses in the US want to know where the wood products they buy come from and what they are. When they know this, they can begin to create a real market for sustainably produced timber and other wood products. And, when the US provides consumers with basic information on what their options are in the wood market, we will be in a position to exercise some international leadership. We strongly encourage you to work with your colleagues to see that US consumers get the information they need, on the origin and species of the timber and wood products they buy, as a critical first step in using the power of the US market to create demand for sustainable wood production.

Mr. Chairman, I thank you again for the opportunity to speak here, and especially for having brought together this exceptional group of people to address the subcommittee.

Haximu: A Proven Case of Genocide

by Davi Kopenawa Yanomami

A statement made to the House Subcommittee on Western Hemisphere Affairs U S Congress, Washington, D C at 1 00 pm on May 10, 1994.

(The first murder of four inhabitants of Haximu village)

The whites killed the inhabitants of Haximu village. The goldminers live near them. The Indians went to where they were and the whites followed them to kill them. The Haximu men thought they could take a rifle back from the goldminers. But, instead, the goldminers followed them and killed four of them. Afterwards, they dug a hole in the ground and buried the bodies. Only one of the four was not buried, the body was lost. The people think that the goldminers threw it in the river.

(The second murder of fourteen inhabitants of Haximu village)

After exhuming the bodies of their kinsmen and cremating them, the inhabitants of Haximu village went to avenge these deaths. They killed one white man. And for this reason the goldminers attacked them again. The villagers did not trust the whites, and they stayed in the forest, although they were not well hidden. Consequently, the goldminers once again went after them and killed them. This occurred in an old Haximu garden. The goldminers killed many people: one man and women and children. They mutilated their bodies with machetes and even tore apart the bodies of the children. The goldminers thought, "This will make these people fear us!" This is why they mutilated the corpses. Just thinking of this, I still feel very sad and angry.

Then I went to Homoxi village. Eight of us went. [Davi and a group of 7 warriors left their village of Demini for Homoxi village to participate in the investigation on August 19, 1993.] We painted ourselves all black, as a sign of revenge. But the whites told us that we were not going there for that, they didn't let us take our bows and arrows (in the helicopter to the site of the massacre). That is why we couldn't take revenge for the Haximu people. If we had lived close to them, we would have killed those goldminers.

They [the survivors of Haximu] began to prepare for the cremation of the people who were murdered there in the encampment at the old garden. First they made two fires. In one they cremated an old woman and her daughter, in the other they cremated the old man who was killed there. Afterwards, they took the remaining bones, pounded them, and filled gourds with the ashes. They carried the other bodies to another encampment nearby. There they made another six or eight cremation fires. After completing these cremations they fled. They really fled. They went to another region. They arrived at the village of the Thomekoshibi, then they went on to the village of the Maamabi. From there they arrived in our forest, called Toototobi. When they arrived, I was advised by radio and I went there. Later officials from FUNAI and the federal police arrived. We went there to find out what happened. We asked, "How many died?" The survivors told us everything just as it happened. The whites have put this story just as it was told into a document.

The gourds filled with ashes (in the baskets) are as numerous as the people that were killed by the whites. There are adults, women and children. This is why we are all in mourning. I am sad and angry because the goldminers killed and mutilated these people. They were destroying our forest and us as well. These are the words that I want to give to you. In this way you can fix them on sheets of paper.

The inhabitants of Haximu community will be avenged eventually. They will be avenged by the spirits of the shamans. When the whites will have gotten rid of all of us through epidemics or gunshots, then those spirits will avenge us. The children or the whites and their women will also die. The old people will also die. The shamanic spirits will consume them all in turn. Omam [the Yanomami mythological creator] will consume them. The whites think that this is not so. But they deceive themselves. Eventually these deaths will be avenged. If all the Yanomami die, the spirits of their souls will attack the whites. They will make them fall ill. This is what you, white people, should think about. You are all still well because there are still shamans living, like me. These shamans keep the angry spirits of the Yanomami dead under control. You think that you are out of danger, but that's not how it is.

We cry; we are sad and angry. But, despite this, our thoughts are calm. Someday we will have our revenge. The shamanic spirits will avenge us. The responsibility for these people who were murdered (in Haximu) is in Brasilia. The goldminers are like wild pigs rooting around in the mud. There are people who make them work and have a hard time in the mud and who make them come back [in our land]. But the leaders who command them will also die.

In the future you will hear about them and you will think, "The ghosts of the Yanomami got their revenge!" You will see this when accidents happen and you will die. These are the words that I give to you.

Embargoed Until Delivered

Prepared statement of Marta Silva Vito Guarani
President,
Kaguatega Association for Displaced Indians - Marçal de Souza

Before the Subcommittee on Western Hemisphere Affairs
Committee on Foreign Affairs
U.S. House of Representatives
Washington, D.C.
May 10, 1994

I have come before this tribunal to speak about the life of the Indians who live in the state of Mato Grosso do Sul, in a region known as the Pantanal. There are nearly 60,000 Indians, of the Guarani, Nhandeva, Kaiowá, Ofaié-xavante, Guató, Kadiwéu, Quinikinawa, Quaxi, and other nations.

They are courageous and brave Indians, who were able to survive the violent attacks of our enemies - white men who in their ambition for land have evicted us. They kill and degrade.

If today the world knows about the beautiful Pantanal (Wetlands) of Mato Grosso - one of the last ecological reserves of the planet - it is because we Indians defend and preserve it.

Much Indian blood has run - and still runs - on the ground of that land. Millions of Indians were killed, and the majority of the different nations were decimated. But there are still many survivors.

The Ofaié-xavante, the people with lips of honey, are a gentle people who have spent the past 100 years being kicked out of one place to another. Today they live on the Paraná River. The government has now taken them from their lands, because it will be flooded in order to build a factory.

The Guató also live there, one of the last Canoeiro tribes left in the world. They were the first inhabitants of the Pantanal. Today, they live on the borders of the Paraguai River, in the city of Corumbá, and some on Insua Island, where they wish to return and live their culture. Their lands are in the process of demarcation on this island.

The Kadiwéu live in Mato Grosso. They are known for the warrior spirit and for the beauty of their pottery decorated with natural paints.

The Terena, who were able to survive from their gardens and planting live in Mato Grosso. They also have problems with the invasion of their lands.

Now I want to speak of my people: the Guarani Nhandeva and Kaiowá. There are statistics which show that we are the poorest and most abandoned peoples in Brazil. We are a people with an ancient culture, descendants of the people of the Sun. There are Guarani in all of Brazil, especially in the southern part of the country. The Guarani are a great indigenous nation which has been able to survive the conquest, perhaps by their nomadic life.

For the Guarani, the core of resistance is religion. But today there are many protestant churches which come to our communities with the same discourse as the Jesuits who came during the "discovery" of Brazil. They are killing our religion, killing our culture. Without a cultural identity, our people wanders the highways and the streets of the cities, drinking, begging, and being ridiculed by the white society.

I am the niece of Marçal de Souza, who was murdered in 1983, by gunmen hired by rich land owners. They wanted him to shut up, because he was denouncing to Brazil and to the world the disrespect with which we are treated within our own country. In Brazil, the murder of Indians doesn't shock anymore. Not the politicians or the government, nor the civil population. There is a minority concerned with indigenous peoples, and for this, we need to sensitize the whole world. And that is what we are doing now.

At the government level, FUNAI [the National Indian Foundation] is in charge of indian issues. We also have a chapter in the Brazilian Constitution. But if we continue dying, suffering, and living in misery, if we are marginalised, we must ask:

- Why the Chapter in the Constitution?
- Why FUNAI?

The lands of my people were occupied by large land owners, who have lands that go as far as the eye can see, full of well treated and well fed cattle. On my land, cattle is worth more than indians!

Many Indians in Mato Grosso do Sul are leaving their communities and moving to urban centers. They go to live in the slums, and little by little they start losing their cultural identity, and become "nobodies". In the villages, they live surrounded by gunmen and by the rancher's cattle. The cattle stomp on their gardens and tractors knock down their houses. The rivers are dirty with the waste from the large farms in the region: pesticides, mercury, etc.

They finished with our forests, they are finishing with what is left of our savannahs. They killed our birds and our animals. And they say that we are no longer Indians because we wear clothes...

Over seven thousand Indians are working in the charcoal factories and in the sugar cane processing plants. They live in a state of slavery. This is the integration that white society offers us. But we Indians, the first owners of this land, cannot accept this humiliating and inhuman integration!

For this reason, young Guarani are killing themselves, they are searching for the end, hanging themselves. The women from the community of Jaguapiré told me that they will kill their children and kill themselves afterwards if they try to take their lands away again. I cannot cross my arms before the massacre of my people.

It is for them that I am here to tell the world that the Indians of Brazil do not see land as private property. Land is important for peoples to survive culturally and in their humanity. To populate an area is to give human value to a place, to complete a stage in our evolution.

Therefore, taking away the means to kill the people. For this, it is necessary to demarcate the indigenous lands in Brazil. It is necessary to secure the land for our survival.

Land is culture and culture is life for us. Brazil needs to stop being the nation which least respects its native peoples on the face of this earth. The true history of the Brazilian Indian remains to be told.

We have resisted for 400 years. We are not enemies, we want to live in peace in this country, with enough ground for all: white, black, and yellow.

Along with me, all the Indians are dreaming of this moment. Marçal de Souza, Angelo Kreta, Simão Bororo, and so many other anonymous heroes have shared this dream with us.

I. AREAS IN CONFLICT (IN JURIDICAL LITIGATION)

Total demarcated lands: 41,624 hectares.

1. Jaquapiré: demarcated and homologated. The community was evicted from their lands three times. Two ranchers are contesting the area.
2. Jarara: demarcated and homologated, but the community was evicted from their village.
3. Sete-Serro: demarcated and homologated by judicial order. Two ranchers are contesting the area.
4. Quassuty: demarcated and homologated, with the case brought by ranchers still in court. Cattle remain in the area.
5. Piragüa: demarcated and homologated. The Guarani are occupying the whole area. The government has brought the case to court, but because these areas are still contested by ranchers, it is feared that they will win.
6. Serrito: demarcated and homologated, and occupied by the Guarani. The case brought against them by ranchers remains in court.

II. AREAS NOT DEMARCATED NOR HOMOLOGATED:

Panambizinho

Taquarati

Sucurí

Non-demarcated areas occupied by the Guarani: 24,240 hectares.

Guarani population: 37,000.

PREPARED STATEMENT OF

Dr. Thomas E. Lovejoy
Assistant Secretary for Environmental and External Affairs
Smithsonian Institution

before the

Subcommittee on Western Hemisphere Affairs
Committee on Foreign Affairs
United States House of Representatives

May 10, 1994

Mr. Chairman, thank you for the opportunity to testify on the topic of deforestation in the Brazilian Amazon. I have been working in the Amazon of Brazil since 1965, first as a graduate student, and subsequently as someone concerned with both the conservation of natural resources as well as related science.

It is appropriate to begin first with a brief consideration of the reasons to be concerned with this topic which may seem very distant from daily life in an American city. I believe a reason of overwhelming importance relates to current efforts nationally and worldwide to engage in truly sustainable development which will not degrade the fundamental resource base. No rational analysis of sustainable development can ignore the premise that biologically based development has to be a central element. This is because of the fundamental trait of living organisms to renew themselves, and because the age of biotechnology we currently are entering is unveiling a great array of new ways to benefit from natural resources.

Environmental clean-up benefits from microorganisms with strange metabolisms and strange appetites capable of removing heavy metals, breaking down aromatic compounds and even able to break down CFCs (chlorofluorocarbons -- the manmade molecules currently destroying the ozone layer). This is but one example of ways in which the entire array of biologically based human enterprises can benefit from biodiversity and generate wealth at the level of the molecule.

That being the case it behooves everyone to be concerned about biological diversity and particularly those areas of particular concentration of biological diversity such as the tropical forests. Of those by far the greatest is the Amazon in toto. Brazil of course has the greatest share of the Amazon, and plays a critical leadership role as the founder and most important member of the Amazon Pact. Brazil is the second most important country in number of mammal species (450), third most important in bird species (1622), first most important in amphibians (517), fourth most important in reptiles (467), and first most important in flowering plants (55,000).

In the 29 years I have been working in the Brazilian Amazon there has been dramatic change. Drs. Tucker and Skole will present this information in some detail. I would highlight the changes in another way. In 1965 the only means of access other than rivers and air strips was the Belem-Brazilia highway. Today, there is the entire TransAmazon highway system as well as the Carajas railroad. In 1965 there were about two million inhabitants in the Brazilian Amazon (roughly equivalent to what was then estimated to be the original Amerindian population). Today there are thought to be about 17 million. Other than those in the major urban centers such as Manaus and Belem, most of them do not know of any way to make a living except through deforestation. This has serious consequences for biological diversity as well as for indigenous peoples as is being addressed separately in these hearings.

There is no question that the deforestation rate has improved since the peak years in the late 1980s. The current estimate is 11,000 square kilometers per year (which Tucker and Skole estimate at 0.3% per year) or roughly half the peak rate. There are nonetheless reasons for continued concern. One is that the absolute number of 11,000 square kilometers is not trivial. Another is that the effects of habitat fragmentation make the numbers roughly three times worse in terms of conservation of biological diversity. The third and most important is that the deforestation is concentrated in certain areas such as southeastern Amazonia where for example the last remnant of an important aggregation of species hangs on in the face of continuing pressure in the Gurupi area.

A further area of concern involves the floodplains or varzea forests, of easy access from the rivers and attractive for conversion to agriculture and also subject to forestry. Important reservoirs of biological diversity themselves, they provide critical ecological support for many Amazon fish species; roughly threequarters of the commercial fish species depend on floodplain forests for the majority of their food. Clearly a major effort is needed to develop a landuse plan for the floodplain forests. Improved scientific understanding of this relationship is needed as well as effective management of the fisheries themselves.

While clearly there has been some improvement, and while the establishment of a special ministry for the legal Amazon last year is a step in the right direction, it is not unfair to say that the situation continues to drift. Roughly a million gold miners continue to disrupt the aquatic ecosystems, mercury pollution is widespread and deforestation continues.

Two key ingredients are needed. One is stronger government involvement and presence. While the current Brazilian constitution empowers the states considerably more than ever before, there are nonetheless federal agencies and mandates which could be more effectively pursued. For example, there is scarcely a forestry extension agent in all of Amazonian Brazil. Demarcation of indigenous lands lags. The rhetoric is good, some actions are good, but the overall effort still lacks considerable resolve.

The second key ingredient is aggressive pursuit of sustainable development to provide nondestructive alternatives for all those already in Amazonia. Fish farming is an example. So are city based activities like the assembly plants of the economic free zone of Manaus. The latter is probably the major reason the state of Amazonas has relatively little deforestation. The IMAZON project in Para is helping moves toward sustainable forestry. Any effort that adds value to what otherwise is only a commodity is also of great importance. In a particularly interesting project, one group of Kayapo Indians has set aside some of their forest as a reserve for nature tourism, but in addition for research that will aid sustainable use practices. One research topic will focus on regeneration of mahogany -- an extremely valuable species which has extremely problematical regeneration after logging.

Of special but longer term value is biochemical prospecting in which the profusion of species are examined for molecules of particular promise for medicinal or other biological purposes. This is not a one time examination because the definition of what is useful enlarges and changes. Nations which protect their biological diversity, and organize the knowledge about it, are attractive to corporations interested in such molecules. Costa Rica's National Institute for Biodiversity, INBio, is the best known example and has contractual arrangements with Merck among others which include an up front "prospecting fee" as well as royalties from anything that becomes commercial including derivative molecules. The National Cancer Institute has somewhat similar arrangements with a number of countries. A number of others inspired by INBio are examining what they might do in this area.

Brazil has long been hampered in this area because of intellectual property rights issues but is now resolving them. Once that happens Brazil will be in a particularly encouraging position because of the presence of a number of pharmaceutical companies. Brazil basically has the potential to be structured vertically all the way from initial prospecting through testing, product development and ultimately manufacture. All that depends, however, on being strongly motivated about protecting the basic resource and promoting interim forms of sustainable development.

Statement of
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and

Dr. David Skole
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before the
Subcommittee on Western Hemisphere Affairs
Committee of Foreign Affairs
U.S. House of Representatives
Washington, D.C.

May 10, 1994

Mr. Chairman and Members of the Subcommittee, we are pleased to appear before you today to discuss NASA sponsored research on deforestation in the Amazon of Brazil.

Deforestation in the Amazon of Brazil

Tropical forests are home to the greatest diversity of plant and animal life known on the earth, and contain over half of our planet's plant and animal species. In recent years, much attention has focused on tropical forests, where as much as 50% of the original extent may have been lost to deforestation in the last three decades, primarily as a result of agricultural expansion. Global estimates of tropical deforestation vary wildly, with 50% to 70% of the global tropical deforestation total attributed to Brazil, which contains ~40% of the world's tropical forest in the Amazon.

The Amazon of Brazil covers ~5,000,000 km² of which 70% is occupied by the non-flooded (terra firme) forest. The rest includes swamp forest, flooded grassland and cerrado or savanna. The difficulties of monitoring changes in this large area have resulted in tremendous disagreements on the extent of deforestation. For example, in 1989 the World Bank published figures stating that as of 1988 ~600,000 km² (~12%) of the Legal Amazon was "cleared" while the Brazilian National Institute for Space Research concluded that ~280,000 km² (~5%) was cleared in 1988. Because of such wildly varying deforestation estimates in the Brazilian Amazon, people did not know whom to believe.

This disagreement over actual figures for deforestation in the Amazon Basin of Brazil prompted NASA to fund our research to independently investigate this confusing controversy. Data from the American Landsat satellites were used in this study. We published our findings in the June 25, 1993 issue of Science.

Our study reached similar conclusions to the Brazilian National Institute for Space Research for deforestation in the Legal Amazon of Brazil as of 1988: 230,000 km² while Brazilian National Institute for Space Research reported 260,000 km² deforested. Most of the differences between the Brazilian (higher) and American (lower) deforestation estimates for Brazil's Amazon resulted from different treatment of tropical forest and tropical savanna in the two studies. An examination of specific areas from both studies shows them to be extremely similar. We therefore conclude that Brazilian estimates of deforestation in Brazil's Amazon are scientifically accurate.

The present rate of deforestation in tropical forests of the Brazilian Amazon has fallen (circa 1992-1993) to approximately 11,000 km²/yr. This means that the deforestation rate there is about 0.3%/yr. By comparison, most National Forests in the United States are logged at a rate of about 1% per year. Furthermore, the government of Brazil has been extremely active since 1990 to reduce the rate of illegal deforestation in Brazil. This, and the removal of tax incentives for deforestation in Brazil, has dramatically lowered the deforestation rate in the Amazon of Brazil to present levels. We hope this trend continues, and the example of the Brazilians in this regard is very encouraging. The continued support of Congress for the Landsat satellites makes possible studies such as the one we have now reported. Landsat satellite data are invaluable for studying the vegetation resources of the earth. At the present time, here simply is no other source of satellite data to perform studies such as the one which we have performed. Our present work is extending the 1978-1988 Skole and Tucker deforestation work to 1992-1993, and will also include the entire Amazon Basin of South America.

Deforestation, Habitat Fragmentation, and Species Losses

Tropical deforestation results in the direct destruction of habitat, through cutting the forest and burning the felled trees. Tropical deforestation also causes indirect effects which adversely affect biological diversity, by isolating areas of forest fragments or patches, surrounded by areas of deforestation, and by providing access into tropical forest from the edge between tropical forest and deforested areas. Both the isolation of forest fragments by deforestation, and the ease of access into formerly-interior tropical forest from deforested areas, result in substantial losses of biological diversity. These indirect effects are called "habitat fragmentation", and are always greater (usually 2 to 3 times) than the area of deforestation.

We thus conclude that while the rate of tropical deforestation in the Amazon of Brazil is substantially lower than previous estimates, it is important to continue to minimize deforestation and thus minimize habitat fragmentation and additional losses to biological diversity. This applies to tropical forests, as well as the forests of North America.

PREPARED STATEMENT OF DR. DAVID L. SKOLE
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before the
Subcommittee on Western Hemisphere Affairs
Committee on Foreign Affairs
U.S. House of Representatives
Washington, D.C.
May 10, 1994

Only five years ago the precise rate of deforestation in the Brazilian Amazon was virtually unknown. Estimates ranged by a factor of 4 or more, anywhere from 20,000 square kilometers per year to 80,000 square kilometers per year. Knowledge of the deforestation rate is extremely important for a wide range of international scientific and policy concerns such as global climate change, the Framework Convention on Climate Change, or policies on forest protection and biodiversity. In spite of its importance, estimating the deforestation rate was mostly a matter of guesswork. Trend extrapolation was one preferred method. Crude estimates of the rate of deforestation in the past were exponentially extrapolated to provide a current estimate.

This poor state of knowledge made it impossible for scientists and policy makers alike to determine how serious a problem deforestation really was. I believe the resulting paucity of consistent and precise quantitative information lead to a kind of complacency in developing policies to manage, or possibly arrest, the spread of deforestation. One effect of this complacency, at both the national and international level, was the increased loss of human life as legal and illegal settlement encroached upon remote regions inhabited by indigenous people of the Amazon.

The Amazon basin of Brazil, often referred to as the Legal Amazon, is an expansive wilderness of rain forest, flooded forest, savanna, and other tropical ecosystems. It is over 5 million square kilometers in size, an area as large as most of the United States. To be sure, the Brazilian Amazon is itself continental in dimensions. The best and most objective way to measure and map the rate of deforestation in this vast region is through the use of remote sensing technology provided by the various earth observation satellites, including Landsat. The Landsat system has been in use since the early 1970s. It can provide the coverage and spatial resolution necessary to know exactly where and when deforestation is taking place. It is feasible to use this technology to make maps with spatial resolution of 100 meters or better. This means individual fields created in a once-undisturbed rain forest can be detected and monitored over time. Deforestation caused by mining, roads, power lines, hydroelectric reservoirs, and other human causes can be measured very precisely.

In research in collaboration with Dr. Compton Tucker of the Goddard Space Flight Center, we use satellite remote sensing data from the Landsat satellites to measure and map deforestation throughout the humid tropics of the world. Dr. Tucker and I have finished an analysis of the deforestation rate and its geographic extent in the Brazilian Legal Amazon for the decade of the 1980s, which was reported in the journal *Science* this past year and in the journal *BioScience* this month.

Without much doubt we now know the actual deforestation rate in the Brazilian Amazon. Our results suggest that at 15,000 – 20,000 square kilometers per year, the rate of deforestation between 1978 and 1988 was actually lower than many earlier estimates. Our estimates agree very much with the estimates from the Brazilian space agency, the Instituto de Pesquisas Espaciais, where they also use Landsat data. However, we are lower than some of the estimates made several years ago by as much as a factor of four. It is important to consider that these are still very large numbers, equivalent to approximately 4 million football fields per year, or 8 per minute.

By applying spatial analysis techniques using a geographic information system, we have also been able to calculate the extent of forest fragmentation. Forest fragmentation depends on the spatial geometry of clearing. For instance, a few scattered clearings will fragment a forest habitat more than a single clearing of an equivalent area. Likewise, highly complex spatial patterns of deforestation as we find in some areas of the Amazon will result in highly fragmented forests. One conclusion of our studies is that forest fragmentation cannot be calculated from the rate of deforestation alone. It is necessary to know the geometry of the deforestation. The only way to measure the spatial pattern of deforestation is through remote sensing.

Another important result of using satellite remote sensing to study tropical deforestation has been the realization that the deforestation process is more complex than we first thought. For a number of years, the conventional wisdom has been that deforestation is a unidirectional process which converts forests into agriculture and other human uses; the Amazon was either a "green hell or a red desert," to quote one author. In fact we now know that a large fraction of the deforested land in the Amazon is in some stage of secondary growth, or forest recovery. Our measurements over the entire Amazon Basin suggest that one third of the deforested land is occupied by secondary vegetation and this fraction is increasing over time. To be sure, these secondary forest systems are nothing like the primary forests they are replacing. However, the regrowth of vegetation following abandonment is an important observation for several reasons. First, these systems are in the process of accumulating carbon dioxide, and to some extent offset the release of carbon dioxide which occurs when the land is cleared and burned. Second, this analysis suggests the important and apparently inseparable coupling between land in active agriculture and secondary growth. The mode of production in this area is predicated upon maintaining both classes of land use.

Finally, the existence of large and increasing areas of secondary vegetation suggests a widespread pattern of land abandonment and a general failure to permanently colonize and settle the region. Indeed, estimates of deforestation rates for the last few years from the Brazilian space agency suggest the rate of deforestation has declined to less than half the rate in the late 1980s. Thus, the problem of land cover change is complex, and cuts across many scales of analysis.

The causes of deforestation in the Amazon are complex. My research suggests that the recent large-scale migration to the Amazon was partly a response to conditions and processes far outside the Amazon itself. They involved land tenure changes in the south of Brazil and changes in the structure of a rapidly developing national economy, to some extent catalyzed by excess petrodollars which were deposited in the banks of the industrialized countries after the oil shocks of the 1970s and subsequently loaned to Brazil for purposes of agricultural modernization. The substitution of machinery for labor, which was an important component of national agricultural modernization efforts, had consequent effects for the forests of the Amazon when land consolidation in the agriculturally productive south displaced small holders, who in turn migrated to the new frontier. Thus, deforestation is a more complex problem than simply too many people. Political, institutional, and economic forces establish and modulate long-term conditions. This view places the causes of deforestation in an international context. The details of this analysis can be found in a paper in the journal *BioScience* this month.

In these studies our objective has been to conduct basic global change research, and as such we have focused purely on scientific issues. But I think it is a testament to the way global change research can benefit many aspects of environmental and policy planning. Monitoring for global change has many positive additional social and economic benefits.

Our approach uses the new technologies of remote sensing and geographic information systems to make detailed maps. These analyses are the first of their kind at such high spatial resolution, and will enable scientists, scholars, and policy makers the kind of information necessary for thoughtful and sustainable development planning for the region. They provide the underpinnings for improved understanding of many scientific questions, such as the role of deforestation in the so-called greenhouse effect, as well as provide the basis for credible short term predictions of where deforestation pressures are most likely to be felt in the coming years. It is my hope that these kinds of data can be used to reconcile the sometimes conflicting goals of economic development and protection of the lands and livelihoods of indigenous people.

This Administration and Congress can do more than it is now doing to support global tropical forest monitoring programs. I realize that the current administration and congress must constantly consider a plethora of needed programs under serious budget constraints. If I were talking about large expenditures of new money to monitor the tropical rain forests, that would be one thing. But I am not. Developing satellite-based monitoring programs which simultaneously fulfill the requirements of global change research and international policy can be done with very marginal new costs, because the tools and know-how exist. It is the mandate that is unclear.

THE DESTRUCTION OF PRE-AMAZONIA:
GOVERNMENTAL NEGLIGENCE VERSUS INDIGENOUS PEOPLES
IN EASTERN BRAZILIAN AMAZONIA

Prepared Statement of William Balée
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before the
Subcommittee on Western Hemisphere Affairs
Committee on Foreign Affairs
U. S. House of Representatives
Washington, D.C.
10 May 1994

EXECUTIVE SUMMARY

I very respectfully acknowledge the Honorable Chairman and Honorable Members of the Subcommittee on Western Hemisphere Affairs for holding this most important hearing regarding the current prospects for indigenous peoples and the natural environment of Brazil. My prepared statement focuses on current threats to the security of indigenous peoples and the biological and ecological diversity of their forested lands in extreme eastern Amazonia, state of Maranhão. This region is the biogeographic province known as Pre-Amazonia, which covers approximately 6000 square miles. Many rare animal species or animal species endangered by local extinction exist inside the Pre-Amazonia, including the Golden parakeet, Harpy eagle, Morphnus guianensis (an eagle), Crax fasciolata pinima (a curassow), a new species of Cebus monkey, and the jaguar. Some of these animal species are endemic to the region. The region has more species of primates than all of Central America. Many of the at least one thousand plant species in Pre-Amazonia are exclusive or endemic to the Belém Pleistocene Refuge and are threatened with local if not generalized extinction as unchecked deforestation in the states of Maranhão and Pará progresses. The indigenous peoples of the region, including the Ka'apor, Tembé, and Awá-Guajá Indians use about ninety percent of these plant species, most of which are trees, as food for people, food for game animals and fish, medicine, construction material, tools, household utensils, fiber, personal adornment, fuel, and many other uses. Much of the plant diversity seems to be associated with ancient agroforestry practices of the indigenous peoples and their ancestors in the region (Balée 1994). The plant species and the indigenous lifestyles associated with them, including indigenous knowledge about how to utilize and sustainably manage these species, are at present most seriously threatened by the existence of about one thousand nonindigenous settlers located illegally inside one of the federally demarcated indigenous reserves of the region.

This region of Pre-Amazonia constitutes a prism through which one can perceive much of the rest of what is unfolding today in the Brazilian Amazon. A most significant point to be gleaned from my statement concerns the virtual absence of Brazilian federal government protection of the human rights of indigenous peoples in this region. In addition, it is alarming that international

financial backers of the Brazilian federal government have been keeping millions of dollars flowing to that government despite its neglect of indigenous human rights and the Amazonian environment, especially in the states of Maranhão and Pará. The World Bank, in particular, has continued to finance one of the most destructive Brazilian state projects yet known with regard to indigenous peoples and the environment of eastern Amazonia, the Carajás mining project of the state-owned Companhia Vale do Rio Doce (CVRD), which has contributed to largescale and illegal deforestation, displacement of indigenous peoples, obstruction of justice, spread of organized crime, illegal land speculation on federally protected lands, and illegal invasion of indigenous reserves and undemarcated indigenous lands. In addition, about 2355 square miles of forest per year since the early 1980s have been cut down, burned, and made into charcoal for use in pig-iron smelting factories in CVRD's Greater Carajás Project (Anderson 1990; Treece 1989; Moran 1993). Much of the timber used for making this charcoal has been coming from the remaining trees of Pre-Amazonia, including trees on indigenous lands.

As a taxpaying citizen and registered voter of the United States, I would like very respectfully to request that the Members of this distinguished Subcommittee ponder two questions. If the Brazilian federal government cannot safeguard from illegal attack and invasion its legally demarcated and confirmed indigenous and biological reserves, which according to the Brazilian Constitution it is obligated to defend, then what, if any, preserve of Amazonian nature or of indigenous people and culture does it, as a nation-state, intend to protect? And if that same federal government of Brazil is granted further aid from international financial organizations in spite of its tragically negligent record on indigenous human rights and the natural environment of Amazonia, why should taxpaying citizens and registered voters of the United States be willing to foot any part of that bill anymore? I entreat you, Honorable Mr. Chairman and Honorable Members of this Subcommittee to consider the proposition that the Brazilian federal government and its international financial supporters should be compelled by imminent financial and legal penalties to fulfill their lawful responsibilities with regard to the indigenous peoples and the natural environment of eastern Brazilian Amazonia in all due haste.

The indigenous peoples, forests, and biodiversity of Amazonian Maranhão represent the last block of relatively undisturbed culture and nature east of the Tocantins River, which is located about 300 miles west of the Atlantic Ocean. This block is also protected by numerous laws and established federal reserves, including an enormous federal forest reserve established by Presidential decree in 1961, two federal indigenous reserves demarcated in 1978 which were confirmed by Presidential decrees in 1982, a federally decreed biological reserve (in which uncontacted Awá-Guajá Indians are also located) which was established and confirmed by Presidential decree in 1988, and an indigenous area for Awá-Guajá Indians, who are among the last foraging nomads in the world, whose demarcation as

an indigenous reserve was ordered by the federal government in 1992 (see map 1). These federally protected areas are all being illegally invaded by ranchers, land speculators, loggers, and squatters, which invasions have been abetted by local and federal Brazilian politicians from 1989 to the present. The regnant political and economic rationale for these invasions, which is also heard elsewhere in Brazil where indigenous reserves are threatened, is that "this is a lot of land for just a few Indians" ("muita terra para pouco índio"). Nevertheless, practically the only forests remaining in the region are associated with indigenous peoples, and vice-versa--where there are no indigenous peoples, there is also practically no forest left, which map 2 illustrates.

The reserves and indigenous areas of Pre-Amazonia (see map 1), which is the biogeographic term for most of Amazonian Maranhão, represent together the only substantial block of forest that remains east of the Tocantins River which could someday be used as the principal seed bank for reforestation projects elsewhere in eastern Pará and western Maranhão, given that its environmental and climatic conditions, flora, and fauna are quite similar to those adjoining regions. These adjoining regions have otherwise largely been deforested by ranching and logging interests as well as by landless farmers since the early 1960s. In contrast, much of Pre-Amazonia is at least legally protected on paper and has been so for more than thirty years. Pre-Amazonia is extremely threatened--much has been lost already--mostly because the Brazilian federal government has abandoned its legal responsibilities to protection of human rights and the natural environment in the region. The Brazilian federal government is leaving its legal wards, the Indians, to their own devices for defending themselves from organized, criminal adversaries. The prospects here and for the rest of the Brazilian Amazon are indeed bleak by examination of the Brazilian federal government's continuing disregard for its own Constitution, its disrespect for the human rights of its indigenous peoples, and its negligence with regard to the biological and ecological diversity of its Amazonian region, of which it seems to be steward only on paper. Yet it is precisely that paper--federal laws, decrees, and accords signed by representatives of the Brazilian federal government over many years--to which this distinguished Subcommittee must appeal in an effort to halt the ongoing destruction of Pre-Amazonia, expel and bring to justice the invaders of these federally protected lands, bring to justice the organizers of these invasions, environmentally restore the degraded parts of those lands, and recompense the indigenous peoples thereof for the losses they have already most unjustly suffered.

THE DESTRUCTION OF PRE-AMAZONIA IN OUR TIME

The Upper Turiaçu Indigenous Reserve (known in Portuguese as the Reserva Indígena Alto Turiaçu), henceforth, the RIAT, is a federal indigenous reservation in the extreme east of Amazonian Brazil, state of Maranhão. This reserve consists of 2048 square miles (and hence it is about the size of the state of Delaware) of

mostly tropical forest (see maps 1 and 2). The RIAT lies within the biogeographic province known as Pre-Amazonia, which covers approximately 6000 square miles, and it is the most pristine part of that province. Many rare animal species or animal species endangered by local extinction exist inside the reserve, including the Golden parakeet, Harpy eagle, Morphnus guianensis (an eagle), Crax fasciolata pinima (a curassow), a new species of Cebus monkey, and the jaguar (Oren 1988; Queiroz 1992). The region has more species of primates than all of Central America (David Oren, oral communication, April 1994). Many of the at least one thousand plant species in the RIAT are exclusive or endemic to the Belém Pleistocene Refuge and are threatened with local if not generalized extinction as unchecked deforestation in the states of Maranhão and Pará progresses (Balée 1994). The Ka'apor, Tembê, and Awá-Guajá Indians use about ninety percent of these plant species, most of which are trees, as food for people, food for game animals and fish, medicine, construction material, tools, household utensils, fiber, personal adornment, fuel, and many other utilitarian ends (Balée 1994). There is considerable ethnobotanical evidence that the present forest together with its plant biodiversity would not exist were it not for agroforestry practices of the indigenous peoples and their ancestors who live within the reserve (Balée 1994).

More than one-half the tropical forest originally within the state of Maranhão had been completely deforested by 1989 (Moran 1993). Much of the remainder, including that which lies on federally protected Indian lands, such as the RIAT, has been rapidly and illegally cleared since 1989 by well-armed and highly organized ranchers, loggers, hired guns, squatters, and land-speculators. (Much of it was also cleared by development projects, such as the COLONE [Companhia de Colonização do Nordeste--see below] and the Carajás Projects of the CVRD [Companhia Vale do Rio Doce], with financial support from international banks, including the World Bank in both instances). The Brazilian federal government has been taking no effective action, moreover, to prevent these invasions, even though it is legally obligated to protect the reserves and their indigenous inhabitants. Many politicians, including the Speaker of the Brazilian House of Representatives, Inocêncio de Oliveira, who allegedly has illegal holdings of some 74,130 acres inside Awá-Guajá lands (CEDI 1994; CIMI 1993c; Porantim 1994) and the current Governor of the State of Maranhão, José Ribamar Fiquene (O Estado do Maranhão 1993d; CIMI 1993d), have been encouraging the invasions of these federally protected indigenous lands and obstructing justice. This is an election year in Brazil. Politicians who can lay claim to having "handed out" land to masses of landless, but voting peasants, even if it is federally protected Indian land, may increase their chances of electoral victory thereby. Even though these illegal invasions are well known in northern Brazil, no federal politician in the states of Pará and Maranhão has yet denounced the illegal activities which are leading to the destruction of Pre-Amazonia and the deprivation of the indigenous peoples therein of their human rights, if not

because of being directly involved in these activities, then perhaps from fear of retaliation by an organized, criminal "gang" ("quadrilha"--Porantim 1991), whose members have been publicly identified, that stands behind the invasions. At present, the entire region seems to lie beyond the control of the federal government of Brazil. The current standoff between Indians and nonIndians in the region is a severe insult to the Brazilian experiment in democracy and is ultimately damaging not only to the Indians but to the Brazilian people themselves.

The RIAT is inhabited by four indigenous groups: the Ka'apor, Awá-Guajá, Tembé, and Kren-Ye Timbira. Loggers, ranchers, and landless peasants have, since 1989, progressively invaded the southern portion of the reserve (CPI 1991; Turner 1993). At present, these illegal invasions account for the conversion of about 20 percent of the forest inside the reserve to rice swiddens and cattle pastures, according to eyewitness testimony (Anonymous 1994). (Another source estimates that as much as one-half, or more than 1000 square miles of the RIAT has been illegally invaded from the south--CIMI 1993d). Almost all the valuable timber from the invaded region has been simply stolen by loggers operating illegally inside the reserve, a practice which is becoming increasingly common on indigenous reserves elsewhere in the Brazilian Amazon south of the Amazon River, especially in the states of Pará (CEDI 1993) and Maranhão (Balée 1990). At the peak of the invasion to date, about 1300 (or 300 households of) landless peasants inhabited illegally this southern portion of the reserve, between the Igarapé do Milho and the Igarapé Jararaca (O Liberal 1992). After some of them attacked a Ka'apor village and burned down some houses in that village (Jornal de Hoje 1993b) in mid-August 1993, the majority were expelled by an uprising of approximately 300 Ka'apor, Tembé, and Timbira Indians themselves on 30 August and 1 September 1993 (Porantim 1994; O Estado do Maranhão 1993a, 1993b, 1993c; CIMI 1993c). This is the first time since 1929, when the Ka'apor and Brazilian government finally came to peaceful terms after nearly one hundred years of warfare, that Indians in the region have joined battle in an organized reprisal against nonIndian intruders on their lands. The Indians burned some two hundred and fifty houses, one hundred swidden fields, and numerous rice granaries of the settlers. Two gunslingers on the nonIndian side were allegedly killed in these actions (Anonymous 1994). The Indians seized approximately one hundred and fifty guns (Porantim 1994). On the other hand, shortly after their expulsion from the RIAT, approximately 260 intruders returned to the area and remain there illegally at present (CEDI 1994). They were later joined by many more settlers, such that the total number of nonIndians once again illegally inside the RIAT is approximately one thousand, based on an overflight of the area conducted by personnel of Brazil's National Indian Foundation (Fundação Nacional do Índio), henceforth, FUNAI, on 11 April 1994 (Watson 1994).

The indigenous inhabitants of the RIAT live in villages, FUNAI Posts, and camps (in the case of some of the Awá-Guajá) located to the north, northwest, east, and south of the focal area of

invasion. A FUNAI Post for the Awá-Guajá known as P.I. Juriti inside the still undemarcated Awá Indigenous Area (Área Indígena Awá) is, at present, surrounded (*ilhado*) by nonindigenous settlers (CEDI 1994). The Indians who dare to go beyond about a 1.8 mile radius of the Post risk being shot at (CEDI 1994). The FUNAI official in charge refuses to order his agents to remove the intruders for fear they would be shot and killed (CEDI 1994). It is strongly believed that some of the masterminds, especially the Galletti Brothers (Irmãos Galletti, whose headquarters are in Açailândia, Maranhão, one of the cities where CVRD has pig-iron smelting factories), of the original invasion of 1989-1993 are planning an even more massive invasion of the RIAT during July--December this year and will be counting on the logistical support of the some one thousand settlers who have already illegally reinstalled themselves inside the reserve (Anonymous 1994; CEDI 1994; Watson 1994). To complicate matters for the local indigenous peoples further, the ranchers and loggers behind this invasion have the support of local and even federal politicians, including the Speaker of the Brazilian House of Representatives, Inocêncio de Oliveira, who allegedly purchased illegally 74,130 acres (116 square miles) inside the Awá-Guajá Indians' Awá Indigenous Area (Área Indígena Awá) from a ranching concern known as Agropecuária Alto do Turiaçu Limitada of São Paulo, which controls 98,840 acres (154 square miles) also located illegally inside the Awá Indigenous Area (CEDI 1994; CIMI 1993c; Porantim 1994).

HISTORICAL BACKGROUND AND LEGAL CHARTERS

The occupation and conversion of these lands by nonIndians is illegal under Brazilian constitutional law (CRFB 1988, Article 231, Paragraphs 1 and 4). The executive power in Brasília in the person of the President is legally obliged to effect the removal of the invaders with all due haste from the confines of the RIAT and carry on with the already ordered demarcation of Awá-Guajá lands. According to Article 231 of the Brazilian Constitution, the federal government of Brazil is responsible for "demarcating, protecting, and demanding respect" for indigenous lands and anything of material value found therein (CRFB 1988). To date, however, no protective or demonstrative action on the part of either the Collor or Franco governments has been taken with regard to the massive, illegal invasion of the RIAT from 1989 to the present (Turner 1993). It is unlikely, moreover, that without stringent pressure, such as immediate suspension of World Bank financing of the Carajás Project and other suitable penalties, that the government in Brasília will take any effective action with regard to this calamity soon. Meanwhile, the hourglass on the human rights of the Ka'apor, Awá-Guajá, Tembé, and Timbira of the RIAT is quickly running out. And their forests are vanishing as we meet here today.

The indigenous reserve known as the RIAT covers 530,524 hectares (that is, about 2048 square miles) situated mostly between the Gurupi and Turiaçu Rivers in northwestern Maranhão state, Brazil. It is today legally inhabited by about 750 persons who are

affiliated with the Ka'apor, Awá-Guajá, Tembé, and Kren-Ye Timbira indigenous peoples. The Ka'apor number about 520 persons of this total. Whereas the Tembé, Awá-Guajá, and Kren-Ye Timbira peoples live in more than one reserve and indigenous area, all the Ka'apor live only within the RIAT. The Ka'apor have lived in this region since the 1870s (APE 1874; APE 1880; Guimarães 1887). All these other groups have also lived in the region since prior to the 20th century (Balée 1988, 1994).

In 1978, the RIAT was demarcated (*demarcada*) by the FUNAI. The demarcation of the RIAT was confirmed (*homologada*) by Decree number 88002 of then President João Figueiredo (CEDI 1984:129; CPI 1991). The demarcation and confirmation (*homologação*) signify legally that this reserve is irreversibly part of the national patrimony of Brazil and that the Brazilian federal government is primarily responsible legally for the protection of its physical integrity. To date, however, this protection has been negligible on the ground.

In fact, the region had been legally protected by the Brazilian Forestry Code since long before the demarcation of 1978 and its subsequent confirmation. About 80% of the present reserve falls within the Gurupi Forest Reserve (*Reserva Florestal do Gurupi*), which was created by Decree number 51026 of 25 July 1961 by then President Jânio Quadros (Oren 1988; CPI 1991; Balée 1990; Survival International 1993) [boundaries not shown on map 1]. It is extremely significant legally that this decree was subsequently never annulled by any sector of the Brazilian federal government. The Gurupi Forest Reserve encompassed 1,674,000 hectares (6463 square miles). In addition to including most of the subsequently demarcated RIAT, the Gurupi Forest Reserve included all the lands now constituted as the Caru Indigenous Reserve (*Reserva Indígena Caru*), the *Reserva Biológica do Gurupi*, and *Área Indígena Awá* (see map 1; Oren 1988; CPI 1991). Although the Brazilian Forestry Code held that forest reserves, such as the Gurupi Forest Reserve, were destined to "maintain the necessary environment for the life of indigenous peoples" and that such forest reserves occupied by indigenous peoples were considered to be under a "regime of permanent preservation" by the federal government (Law number 4771, article 3), the Brazilian Forestry Agency of the time (IBDF, called IBAMA since 1989) took literally no action to prevent the gradual devastation by nonIndians of about 2000 square miles (or about one-third) of the Gurupi Forest Reserve during the period 1961-1991 (CPI 1991; Oren 1988). Recently in a positive move, the IBAMA did seize and auction off 3268 cubic yards of trunks of pau d'arco, jatobá, and tropical cedar which had been illegally felled for commercial purposes inside the reserve known as the Gurupi Biological Reserve (*Reserva Biológica do Gurupi*). A part of the Gurupi Forest Reserve, it was established by Presidential Decree number 95614 on 12 January 1988 for protection of the remaining flora and fauna of Pre-Amazonia--it adjoins the RIAT and the *Área Indígena Awá* [O Estado do Maranhão 1992c]. On the other hand, to date the IBAMA has not acted to impede the illegal devastation by loggers, cattle ranchers, and landless peasants of Maranhão's

indigenous reserves, reserves whose flora and fauna are also destined for protection by the forestry agency according to federal law. The head of the IBAMA agency in Imperatriz, Maranhão even stated publicly that "the problem of commercial logging on indigenous reserves is FUNAI's problem; IBAMA has nothing to do with it" (O Imparcial 1992b). In addition, since 1992 much of the Gurupi Biological Reserve has been illegally deforested (CEDI 1994), despite good intentions inside IBAMA.

It was not until the FUNAI established the RIAT and to the south the Caru Indigenous Reserve (Reserva Indígena Caru, which consists of 175,000 hectares (676 square miles) and which was demarcated in 1978 and confirmed by Presidential Decree number 87843 in 1982) that some stability to indigenous lands in Pre-Amazonia would be made possible during the early 1980s. Nevertheless, from 1989 to date, these two reserves have been proving to be nothing more than paper reserves.

THE ILLEGAL INVASION OF THE UPPER TURIAÇU INDIGENOUS RESERVE (RIAT), 1989-1994

The current invasion of loggers, cattle ranchers, and landless peasants that is sweeping the drainages of the Igarapé do Milho and Igarapé Jararaca within the southern portion of the RIAT does not represent, by any means, a natural expansion of the Brazilian frontier nor even the fulfillment of a Brazilian national manifest destiny in eastern Amazonia. It represents, rather, the unfolding of a criminal enterprise that has gone relatively unchecked (and sometimes even aided and abetted) by Brazilian federal authorities since its inception in the late 1980s. The 1300 landless peasants who stand on the frontlines of this illegal invasion are not and likely never will be allies of the indigenous peoples inside the RIAT and elsewhere in reserves of Pre-Amazonia (O Estado do Maranhão 1992b; O Debate 1992; Turner 1993). The landless peasants are, rather, pawns in a colonial type of northeastern Brazilian society still dominated by a debt-peonage and patronage system called coronelismo. However much these landless peasants will themselves be unlikely to escape from poverty and exploitation at the hands of the owners of latifundia in the region (who are cattle ranchers and loggers for the most part), the Indians cannot by law be coerced into bearing any part of the peasants' or any other outsiders' economic hardships. "Lots of land for few Indians" has become a convenient slogan, however, for those who would open up Indian lands to increasingly restless and numerous peasants who have no land of their own.

The Ka'apor, Awá-Guajá, Tembé, and Kren-Ye Timbira Indians had no part in inventing coronelismo, latifundia, and the landless condition of most of the regional peasantry. To ask of the Indians that they accept the presence of poor nonIndians within the reserve is to request that they forego their legal rights to the reserve so that coronelismo may expand yet farther into and ultimately destroy what remains of indigenous lands in Pre-Amazonia. The problem of landlessness is primordial between the landowners and the

nonIndian peasants themselves and can be resolved only by them. The most just (if not the most obvious) solution to the landless condition of the regional peasantry is genuine agrarian reform, not the temporary and illegal solution of either passively allowing or even actually encouraging thousands of landless peasants to spill onto indigenous lands inside federally protected indigenous reserves. Unfortunately, even the regional peasants would rather oppose the Indians than the landowners in their struggle for land (O Estado do Maranhão 1992b). Maranhão has the highest rate of assassinations over land of any state in the Brazilian Amazon. More hired guns per capita reside there, especially in the city of Imperatriz, than in any other Brazilian state. Maranhão largely reflects the general pattern of lopsided distribution of farmland in the country: 70% of Brazilian farmers are landless whereas 81% of all the farmland is held by just 4.5% of the population (Stern et al. 1992 cited in Moran 1993). In the current scenario in eastern Amazonia, the Indians are being forced to give up their lands as an escape valve for the major landowners in a concerted effort to prevent any real agrarian reform (CIMI 1993c).

The RIAT was subject to many illegal incursions by outsiders since its confirmation in 1982. There has been frequent evidence of poaching. Occasionally, especially along the eastern perimeter of the reserve, one or more households of landless peasants tried to establish swiddens, but were repulsed by agents of the FUNAI and Federal Police. Prior to 1982, parts of the region now lying outside the eastern boundaries of the reserve that were inhabited by Ka'apor Indians were slowly devastated by incoming settlers. In 1974, the Brazilian Army completed the paving of the BR-316 highway (Andreazza 1974), which cut through Ka'apor garden lands in the Paruá and Maracaçumé River basins. As settlers established towns along the highway, the Ka'apor of this extreme eastern area moved gradually west (Balée 1990). Between 1970 and 1980, the nonIndian population immediately to the east of the Ka'apor along the BR-316 grew by 111% (IBGE 1981:xviii). Many of these settlers were aided by a federal agricultural cooperative, the COLONE (Companhia de Colonização do Nordeste, or Northeast Colonization Company, which is a government project that has resettled thousands of landless, poor peasants from Northeastern Brazil in the Amazon region of Maranhão and which has also engendered massive deforestation in the region), which, together with the BR-316 and the Carajás Project of the CVRD (Companhia Vale do Rio Doce) to the south, was partially funded by the World Bank (Jornal do Brasil 1980). The COLONE today holds title to about 3475 square miles east of the Ka'apor reserve, almost all of which has been completely deforested since the early 1970s (Oren 1988; see map 2). A forest reserve which was established by the original loan agreement between the COLONE and the World Bank had been completely deforested by COLONE's settlers by 1987 (Oren 1988). In 1982, at the time of the confirmation (*homologação*) of the now demarcated RIAT, five Ka'apor villages totalling about 60 persons still existed in the Paruá River basin up to 16 miles to the east of the boundary of the reserve. The region was still forested. But by 1984, in the face of an advancing

frontier of landless peasants and loggers, all the persons from those villages had moved to a new site called Ximborendá, only 1.2 miles within the eastern boundary of the reserve. By 1987, according to on-site surveys, the entire basin of the Paruá River (about 386 square miles) had been deforested and occupied by landless peasants (Balée 1990; see map 2: a satellite image taken on 5 July 1990, it clearly shows this devastation). The Paruá River basin had been part of the forested homeland of the Ka'apor Indians since the 1870s (APE 1874; Guimarães 1887:62-63). It is in the final stages of conversion to cattle pasture today.

Once it became clear to loggers who had operated on the eastern frontier of Ka'apor lands since the 1970s that the only timber remaining was to be found inside the RIAT, some of them attempted to cut logging trails into the RIAT itself. The fact that the COLONE had built roads leading up to the RIAT's eastern boundaries facilitated the loggers' task. In November 1987, some Ka'apor Indians from Ximborendá surprised a group of loggers on a newly cut logging trail inside the reserve and forced them to withdraw from the reserve; in 1988, the FUNAI agent in charge of the FUNAI post that had been established at Ximborendá was accused by the Indigenous Missionary Council (Conselho Indigenista Missionário), henceforth, CIMI, of illegally selling timber inside the reserve to outside loggers (CIMI 1989). (The FUNAI agent was finally suspended from his Post for professional misconduct in 1991--he as at present responding to a criminal inquiry for that alleged misconduct--Anonymous 1994). Despite these problems near Ximborendá, the invasion by loggers and landless peasants in this part of the reserve now appears to have been held relatively in check. There is no evidence of current occupation by settlers in this area. Satellite imagery from July 1990 (see map 2) shows the effects of selective logging in and around the village of Ximborendá just inside the eastern border of the reserve, but this destruction took place during 1986-1988 and is small compared to that now being effected in the southern portion of the reserve.

In May 1989, a Ka'apor headman named Petrôí, together with twelve other Ka'apor and twenty Tembê Indians from the RIAT arrived in Belém to denounce an invasion of loggers in the southern portion of the RIAT; the local office of FUNAI in Belém confirmed that what Petrôí claimed was true and added that a FUNAI team would be dispatched to the area soon to investigate the matter and "grant the requests of the tribes" (O Diário do Pará 1989). By January 1991, federal police (at the behest of FUNAI) together with two FUNAI agents had visited the area of the logging trails in the southern portion of the reserve four times; although the police managed to seize two skidders (which are enormous logging trucks that haul cables used to drag entire standing trees and stumps to the yard or skidway) and some twenty smaller logging trucks, they quickly returned these to their owners, the some forty loggers who were invading the reserve (CPI 1991; O Liberal 1991). In December 1990, a logger and landowner named Nildo Ferreira da Silva (alias Nildo Ferreira da Silveira), who was one of the original masterminds of a criminal scheme to defraud the Indians of the RIAT

of their land (see below), had threatened to kill a Timbira Indian man, Sibá, should he dare try to impede the invasion (O Liberal 1991; Porantim 1991). On 15 January 1991, some 31 Ka'apor, Timbira, and Tembê Indians asked for assistance in curbing the invasion of the RIAT from the Legislative Assembly of the State of Pará (O Liberal 1991), only to receive no offers of help, even though (or perhaps because) a large portion of the timber being extracted from the RIAT is processed in the sawmills of Paragominas, a notoriously violent frontier town in southern Pará (Oren 1988; O Liberal 1992; CIMI 1990; CPI 1991; O Imparcial 1992a).

The principal commercial timber species of the RIAT include pau d'arco (*Tabebuia* spp.), jatobá (*Hymenaea* spp.), sucupira (*Diploptropis purpurea*), tatajuba (*Bagassa guianensis*), tropical cedar (*Cedrela fissilis*), piquiá (*Caryocar* spp.), and maçaranduba (*Manilkara huberi*). With the exception of tropical cedar and pau d'arco, most of these species have mainly an internal, Brazilian market only. These timbers were being illegally extracted from about forty logging trails (which had been surveyed before being cut) between the Igarapé do Milho (which constitutes the southern boundary of the RIAT) and the Igarapé Jararaca. The trails lead to the latifundium of Gerson Pereira dos Santos (a.k.a. the "Goiano"), whose ranch illegally is located both within the RIAT and the Área Indígena Awá (occupied by Awá-Guajá Indians), on both sides of the Igarapé do Milho (see map 1). The ranch of Gerson Pereira dos Santos is, moreover, entirely within the boundaries of the Gurupi Forest Reserve. The logging roads which pass through his property ultimately lead to a road which connects Paragominas to the town of Zé Doca in Maranhão, also a center of sawmills and lumber companies which process timber illegally removed from Indian lands (CPI 1991). The landless peasants who established homesteads along these logging trails arrived after the valuable timber had been removed.

This invasion, which accounts for the devastation to date of approximately twenty percent of the RIAT (a proportion which is likely to rise much higher before the end of 1994 unless vigorous measures are taken very soon to prevent further invasions and remove the invaders who are at present inside the reserve), appears to have been extremely well planned from the beginning. In 1989, the logger and rancher known as Nildo Ferreira da Silva (alias Nildo Ferreira da Silveira), who is originally from the city of Rio de Janeiro, set up a cartório (title company) in Imperatriz, Maranhão and in Belém, Pará (CIMI 1993c; cf. CPI 1991; Porantim 1991; Turner 1993). Then he and Nicodemus Marcos Martins of Imperatriz, Maranhão forged hundreds of deeds to lands lying within the RIAT. These were sold cheaply by Nicodemus Marcos Martins and Gerson Pereira dos Santos and his wife Neumar Lemes to various local cattle ranchers as well as hundreds of landless peasants. The total lands within the confines of the Gurupi Forest Reserve sold off illegally by Nildo Ferreira da Silva, Nicodemus Marcos Martins, and Gerson Pereira dos Santos and Neumar Lemes total approximately 772 square miles, of which about half lie within the RIAT (CPI 1991; Jukofsky 1991; Porantim 1991; O Liberal 1992). When the

Indians finally expelled the intruders at point of arms in August and September 1993, many of the squatters claimed not to know that they were occupying Indian lands (Porantim 1994). The land-speculators from Imperatriz (the city from which 90% of the invaders have come--O Estado do Maranhão 1993b; O Debate 1993c), including Nicodemus Marcos Martins, for whom a settlement inside the Indian reserve was named and who had sold landless peasants plots of land (Porantim 1994), evidently neglected to mention that these plots were located within the boundaries of a federal indigenous reserve. Larger landowners also bought plots of land, but they apparently knew what they were getting into (CIMI 1993c).

One of the major purchasers of these lands allegedly was Antônio Chaves Borges, who is believed to have been part of the conspiracy since 1989 (O Liberal 1992; O Debate 1993c; Jornal de Hoje 1993a). Other alleged holders of illegal land titles in the area include Edson Lobão who is former Governor of the State of Maranhão and relatives of the ex-President of Brazil, José Sarney, whose influence in the politics of his native Maranhão continues to be great even though he is now a Senator from Amapá as well as a potential candidate in this year's Presidential elections (CPI 1991; Jukofsky 1991) and the current Governor of the State of Maranhão, José Figueira (Anonymous 1994). The core conspiratorial group consisting of Nildo Ferreira da Silva (or Nildo Ferreira da Silveira), Antônio Chaves Borges, Nicodemus Marcos Martins, and Gerson Pereira dos Santos and Neumar Lemes has been aided by a major landowner to the south, with illegal holdings both in the Awá Indigenous Area (Área Indígena Awá) and the Caru Indigenous Area (Reserva Indígena Caru), namely, the Galletti Brothers (Irmãos Galletti). One reliable source believes that the Galletti Brothers are the principal forces behind the current invasion; this source claims further that the Galletti Brothers believe that one-half the indigenous areas of Pre-Amazonia "belongs to them," since "this is a lot of land for just a few Indians" (CEDI 1994). In May 1991, Nildo Ferreira da Silva and the Galletti Brothers audaciously introduced an "absurd" lawsuit in the Judicial District of Carutapera (Gurupi River basin district in northern Maranhão) against specific FUNAI agents who work inside the Área Indígena Awá for being "invaders of private property" (Porantim 1991). Also in May 1991, a group of hired guns led by a man identified only as Alcebiades stumbled across three men poaching inside the Área Indígena Awá. The hired guns believed the three to be FUNAI agents and therefore beat and brutally tortured them until the hunters convinced them they were not FUNAI agents (Porantim 1991). It is believed that the leaders of the conspiracy, who have been collectively described as a criminal "gang" (*quadrilha*), consisting of Nildo Ferreira da Silva, Nicodemus Marcos Martins, Gerson Pereira dos Santos, Neumar Lemes, Antônio Chaves Borges, and the Galletti Brothers have in their joint employ eighty hired gunmen (Porantim 1991), including at least three men who seem to be also members of the Military Police of the State of Maranhão (O Liberal 1992).

THE FAILURE TO DATE OF COUNTERMEASURES

The attempts in May 1989 and January 1991 (O Diário do Pará 1989; O Liberal 1991) by some Ka'apor, Tembê, and Timbira to publicize and gain official support to counter the invasion of the RIAT met with failure. One might argue that they, like some of the Kayapó, should resist this invasion violently. Yet in this region and under the circumstances, it is, in fact, palpably dangerous for the Indians to try to continue resisting the invasion with the force of their arms alone. Since the death threat that Nildo Ferreira da Silva made against Sibá in 1990 (O Liberal 1991), violence between Indians and nonIndians in the region began to increase. Between 1991-1993, five Awá-Guajá Indians in the region had been killed in conflicts with landless peasants; another Awá-Guajá man, who disappeared during a hunting expedition in the RIAT in late 1992 is presumed to have been ambushed and murdered by nonIndians (CIMI 1993b). On 24 September 1992, an Awá-Guajá man with his bow and arrow shot and killed an invader named "Chico Índio" who had been fishing illegally inside the reserve known as Caru Indigenous Reserve (Potiguara 1992). While it is true that a group of Ka'apor successfully turned back an invasion of loggers at Ximborendá in 1987 (CIMI 1989) and that many Indians expelled hundreds of invaders from the southern portion of the reserve in 1993 (Porantim 1994; O Estado do Maranhão 1993a, 1993b, 1993c; CIMI 1993c), they together with the other Indians of the RIAT are no match over the long term for the hired guns of Nildo Ferreira da Silva, Nicodemos Marcos Martins, Gerson Pereira dos Santos, Antônio Chaves Borges, and the Galletti Brothers, who have the support of the region's politicians. The Indians inside the RIAT, moreover, who number fewer than 800 in total, are already outnumbered by the approximately one thousand settlers now illegally homesteading again inside the southern region of the reserve. A minority of Ka'apor, Tembê, Timbira, and especially Awá-Guajá men own firearms (the disposition of the invaders' arms that they seized in 1993 is unknown). Fewer yet are skilled with using firearms. Their bows and arrows are no match for the sophisticated weaponry, allegedly including Uzzi automatic guns, believed to be in the hands of the ranchers' hired gunmen. The total indigenous population of the RIAT, moreover, is profoundly outnumbered not only by the landless peasants now illegally homesteading inside the frontiers of the reserve but by hundreds more who are expected to arrive during the dry season of 1994.

Attempts by individual Indians to resist loggers operating illegally inside their lands elsewhere in Maranhão have met with assassination. For example, the Gavião Indian named Domingos Gavião was shot to death by a logger named Coraci Mendes on 1 December 1992 while he tried to prevent Mendes from illegally removing timber from the Governador Reserve in southern Maranhão (Jornal do Brasil 1992; Folha de São Paulo 1992a). Threats made against the lives of Indians inside the RIAT are not idle. Clearly the Ka'apor, Awá-Guajá, Tembê, and Timbira Indians cannot reverse the tide of invasion by force of their arms alone nor can their resistance

alone bring permanent security to their physical persons and their lands. It is true that they successfully expelled about 1300 invaders in August and September 1993. That was only a skirmish. A more massive and well-planned invasion is likely to be underway during this year's dry season (CEDI 1994; Watson 1994). The indigenous peoples simply do not have the leadership, numbers, tactical skills, organization, nor weaponry to win any prolonged engagement such as a land war. Organized crime outclasses the Indians on all these fronts. It therefore must be countered by other means.

One of these means obviously involves the federal Brazilian judiciary. Unfortunately, both for Brazil and for the Indians, however, federal courts with regard to the invasion of the RIAT and surrounding indigenous reserves are proving themselves to be morose and contradictory, if not inert and totally ineffective. Based on litigation brought by FUNAI in 1989, Federal Judge Cândido Arthur Ribeiro Filho ordered that nonIndian invaders be removed immediately from the RIAT on 4 March 1991, indicating that Nicodemus Martins Marques (sic), Nildo Ferreira da Silveira, Neumar Lemes and Antônio Chaves Borges were leading the illegal invasion (O Debate 1993c; Jornal de Hoje 1993a), but his order was ignored. Later Federal Judge Cândido Aristides Medeiros of the District of São Luís, Maranhão finally signed a judicial order in March 1992 requiring that the homesteaders of the RIAT "immediately depart from" the reserve (O Imparcial 1992a; O Liberal 1992). The judge offered no provisions, however, for removing the invaders, even though, as with all federal judges, he had the authority to command the federal police to take such action. The invaders remained until the events of August and September 1993. Nicodemus Marcos Martins, moreover, who had already been indicted in federal court for forgery and illegal land speculation (*grilagem*), was finally arrested by federal police and jailed in São Luís in November 1993 (O Estado do Maranhão 1993e). But he was subsequently released from jail after he "paid his way out" (Watson 1994).

On 16 July 1992, the Awá Indigenous Area, home to an indeterminate number of Awá-Guajá Indians (indeterminate because some have no contact with FUNAI), was officially ordered to be demarcated by the President of FUNAI, based on the internal report of delimitation (or official survey) of the area, called *delimitação*, which had been approved in June 1992 (FUNAI 1992). In addition, on 27 July 1992, the Brazilian Minister of Justice declared in Decree 373 the Awá Reserve to be of permanent possession of the Awá-Guajá people and authorized that the demarcation proceed forthwith (Survival International 1993). This reserve is located immediately to the south of the RIAT and its integrity is indispensable to that of the RIAT. (Many of the invaders of the RIAT, including Gerson Pereira dos Santos and Neumar Lemes, had gained access to the reserve through first invading the Awá Indigenous Area). On 21 November 1992, however, Brazil's highest court, the Supreme Tribunal of Justice (Superior Tribunal de Justiça) recognized that the Agropecuária Alto do Turiaçu Limitada of São Paulo, a ranching concern of 98840 acres

(154 square miles) hectares inside the Awá Indigenous Area, from which the Speaker of the Brazilian House of Representatives allegedly bought about 74130 acres (116 square miles) also inside the Awá Indigenous Area (CEDI 1994; CIMI 1993; Porantim 1994) had permanent rights to its holdings (Correio Braziliense 1992). This unfortunate decision, of course, directly contradicted the existence of the Gurupi Forest Reserve, given that the Awá Indigenous Area lies entirely within that older reserve.

The powerful landowners illegally operating within the Área Indígena Awá, Reserva Indígena Caru, and the RIAT are not alone in their opposition to the human rights of the indigenous inhabitants of these reserves. While it is true that the major landowners were united through ASCEM (Associação dos Criadores do Estado do Maranhão or Livestock Breeders of Maranhão Association), a regional cattlemen's association, in their opposition to the demarcation of Awá-Guajá lands in 1992 (O Estado do Maranhão 1992a), it is also sadly the case that the rural workers' union, FETAEMA (Federação dos Trabalhadores na Agricultura do Maranhão or Federation of Agricultural Workers of Maranhão), under the leadership of José Raimundo Mendonça, was opposed to the demarcation of the Área Indígena Awá, going as far as to state officially that this would lead to the "shedding of blood" between Indians and nonIndians (O Estado do Maranhão 1992b). In fact, his predictions have already come true because of the intransigence of invading squatters and their supporters at the end of August and beginning of September 1993. It is increasingly likely that more lives, both of Indians and nonIndians, will be lost in the dry season of 1994 as a new, more massive invasion is believed to be planned. Regrettably, the rural workers' union, which supposedly represents landless peasants, has chosen to attack the weakest link, the indigenous peoples, in this frontier chain of societies, rather than clamor for agrarian reform (O Debate 1992). In other words, the leaders of landless peasants are more eager to appease the major landowners, who are responsible for their landlessness than ally themselves with the Indians. The major landowners, such as the Galletti Brothers, for their part, wish to encourage the invasion of Indian lands by squatters so that they will have effected a fait accompli. It is politically a difficult decision to eject thousands of poor, landless peasants from Indian reserves once they are already there, for their situation represents a "social problem" (CEDI 1994). The conjoining of indigenous and peasant land and social problems in the context of Pre-Amazonian Maranhão, however, would result in the destruction of the Indians and the flora and fauna of their lands.

Although the demarcation of the Área Indígena Awá was ordered by the President of FUNAI in July 1992, it has yet to come to pass. Demarcation involves the physical installation of bronze plaques embedded in concrete every nine-tenths of a mile along the boundaries of any indigenous reserve--these plaques were uprooted, incidentally, along the Igarapé do Milho by invaders of the RIAT in 1989-1990. Because of the presence of many well-armed invaders inside the Área Indígena Awá, FUNAI formally requested the Brazilian Army to effect the demarcation in December 1992, with

funds to be provided by the CVRD (Companhia Vale do Rio Doce), the state-owned company that controls the vast Carajás iron ore fields and whose railroad runs along the southern border of Awá-Guajá lands. The CVRD is legally obligated to prevent the desecration of Indian lands within the purview of the Carajás Project, including the RIAT, according to a protocol it signed with representatives of the FUNAI in 1982, Accord No. 059/82 (Folha de São Paulo 1992b; Turner 1993). In fact, CVRD promised the World Bank, which loaned it \$300,000,000 as part of the original loan agreement, that it would demarcate and protect the lands of the Awá-Guajá, who are among the last foraging nomadic people in the world. Yet by late March 1993, the Brazilian Army had not yet prepared the budgetary calculations for the federally mandated demarcation; as such, the CVRD had released no funds for the project (CIMI 1993b). This bureaucratic farce shows no sign of abating. The forests will be destroyed before the current Brazilian federal government lifts a finger to obey its own Constitution unless vigorous external pressure is brought to bear on both that government and its international financial backers as soon as possible.

On 23 March 1993, 150 Awá-Guajá, Guajajara, Ka'apor, Krikati, and Timbira Indians blocked the Carajás Railroad at a point 299 km from São Luís, near the Caru Indigenous Reserve. They demanded that the Awá Indigenous Area and lands of the Krikati (an indigenous group of Timbira in southern Maranhão) be demarcated immediately (O Imparcial 1993). On 24 March 1993, the CVRD formally agreed in writing with the Indians and representatives of the FUNAI to supply the funds for demarcation of these two areas by April 1993 (O Debate 1993c), but by early May 1994 this has still not come to pass. The current prospects for the RIAT are grim. According to CIMI, "Regarding the removal of invaders from the lands of the Urubu-Kaapor [Ka'apor] . . . Indians, Vale do Rio Doce [CVRD] only states that it is a necessary measure" (CIMI 1993a). Clearly, the CVRD and its international supporters, chief among them being the World Bank and the European Coal and Steel Community (Survival International 1993), would absolve itself of responsibility for undoing the current invasion of and for preventing further invasions of the RIAT as well as other reserves within its legal purview. As of May 1994, "CVRD refuses to do anything about this problem" (Watson 1994). In fact, much of the environmental destruction and displacement of Indians in the Pre-Amazonian region is due to activities of the CVRD. About 2355 square miles of forest per year have been cut down, burned, and made into charcoal for pig-iron smelting factories in CVRD's Greater Carajás Project (Treece 1989, cited in Moran 1993). Most of the timber used in making this charcoal has come from the trees of Pre-Amazonia, including trees on indigenous lands.

CURRENT PROSPECTS

In the final analysis of this debacle which features violations of the human rights of indigenous peoples, state-level obstruction of justice, multistate-level incompetence, organized

crime, and environmental devastation, all political roads still lead to one source in Brazil. The CVRD, FUNAI, Federal Police, and the Brazilian Army, according to the Brazilian Constitution of 1988, all must obey the orders of the executive power in Brasília, namely, that of the President. He has the authority to reverse the tide of destruction in Pre-Amazonia. And he should be compelled to do so by financial, legal, and political penalties that can be applied against his country on the world stage. If he is a patriot, as the author of this report believes him to be, he will respond to these pressures in ways that may help forestall the total destruction of the federal reserves of Pre-Amazonia and the deprivation of the Ka'apor, Awá-Guajá, Tembé, and Timbira who live therein of their human rights. The current President may be unwilling to take such action, however, perhaps because he will shortly become a lame duck President anyway, given that Presidential elections are to be held later this year. Perhaps the new Brazilian President, who will be sworn into office in 1995, will have the courage and determination to obey his or her country's laws and to help rescue this very important part of Brazil's national patrimony. By so doing, he or she would rightly defend the legitimacy of the Brazilian nation in its stewardship of the Amazon region before the world. But by then it may be too late for the indigenous peoples and forests of Pre-Amazonia.

RECOMMENDATIONS

I therefore very respectfully recommend to the Honorable Chairman and Honorable Members of the Subcommittee on Western Hemisphere Affairs of the Foreign Affairs Committee, U.S. House of Representatives, that:

- 1) it bring a motion to the floor of the U. S. House of Representatives to establish a House Commission for the study of whether the United States should suspend financial support and taxpayers' dollars from the World Bank and any other international financial organizations involved in social and environmental devastation in the Brazilian Amazon;
- 2) it bring a motion to the floor of the U.S. House of Representatives demanding that the World Bank immediately suspend all financing of the Greater Carajás Project (Projeto Grande Carajás) of CVRD (Companhia Vale do Rio Doce), including the Proposed Loan currently (as of 1 April 1994) being negotiated, which is known as "Environmental Conservation and Rehabilitation" (Project ID number 6BRAPA299) in the amount of \$50,000,000;

3) it bring a motion to the floor of the U.S. House of Representatives to request the Brazilian House of Representatives (Câmara dos Deputados) to establish a Commission of Inquiry (Comissão de Inquérito) into illegal invasions of federally protected biological and indigenous reserves in Maranhão and the alleged involvement of elected Brazilian officials, including the current Speaker of the Brazilian House of Representatives in these invasions, and their alleged violation of Article 231 of the Constitution of the Federative Republic of Brazil for possible impeachment proceedings;

and

4) it bring a motion to the floor of the U.S. House of Representatives to request that the executive branch of the Brazilian federal government under the leadership of President Itamar Franco immediately take the necessary actions to remove all invaders from established biological and indigenous reserves and indigenous areas in Maranhão, to prevent further invasions of the same reserves and areas, to effect the demarcation of the Awá Indigenous Area (Área Indígena Awá), to bring the perpetrators of these invasions to justice, and to recompense the indigenous peoples of the same reserves and areas for the social and environmental losses they have already suffered.

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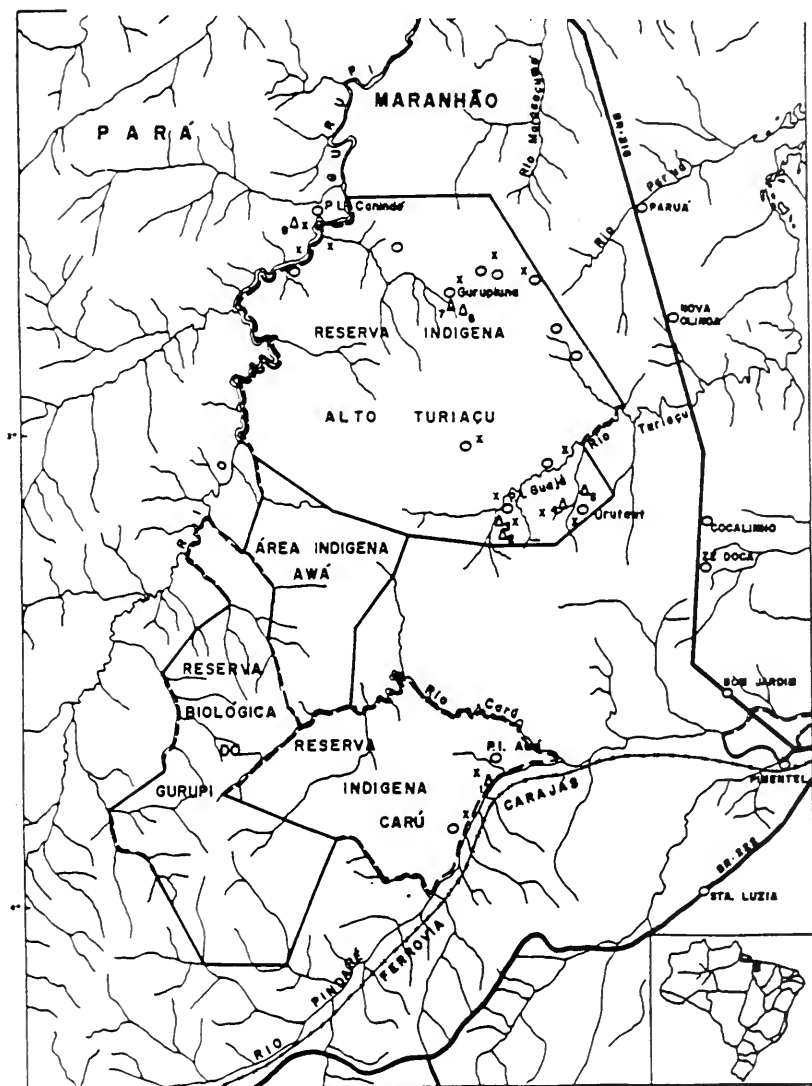
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*Copies of written sources listed here will be supplied, for the cost of photocopying, to any Member of the Subcommittee on Western Hemisphere Affairs upon written request to the author of this prepared statement.

Map 1: Federal Biological and Indigenous Reserves of Maranhão, Brazil. Sites of ethnobotanical research of the author (1985-1991) are also indicated. Note the CVRD railroad toward the bottom.

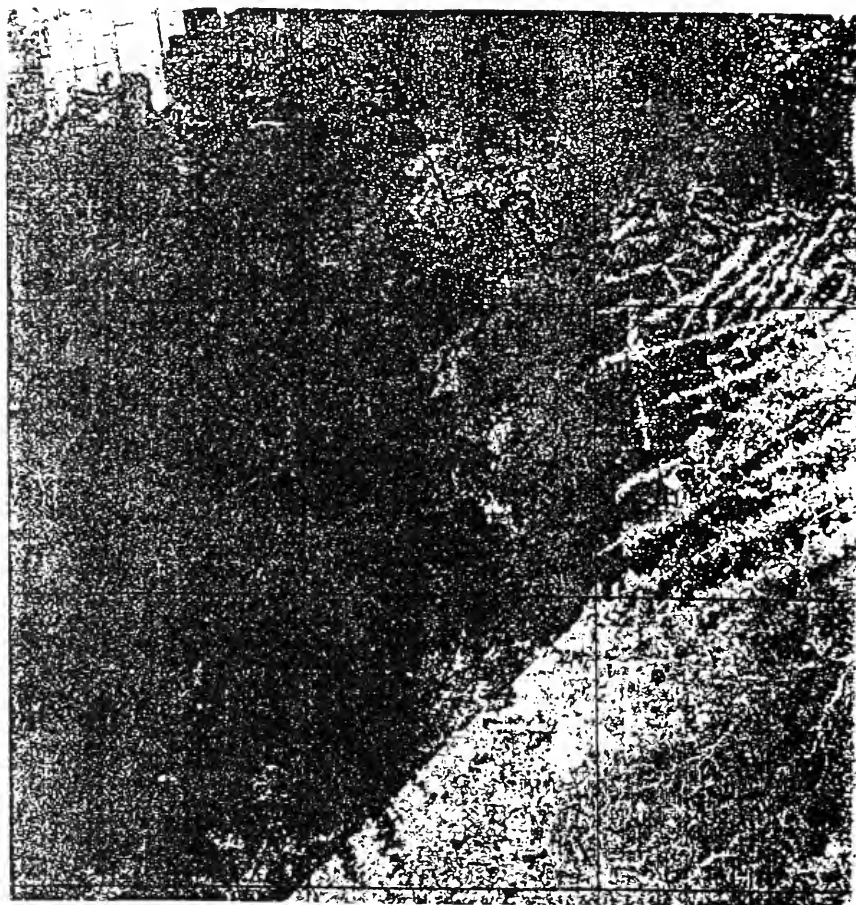


LEGEND

- Limits of Indigenous or Biological Reserve
- Paved road
- Railroad

- △ Hectare Inventory and Site Number
- × Environs of General Collections
- Indian Village, FUNAI Post, or

Map 2: Satellite image of the Upper Turiaçu Indian Reserve (RIAT) taken on 5 July 1990. Note especially deforestation (shown in pink) in the area of COLONE to the east of the nearly straight line representing the eastern boundary of the reserve. Courtesy of Anthropological Center for Training and Research on Global Environmental Change, Indiana University.



The Natural Environment and Indigenous Peoples of Brazil

Background

Brazil's Amazon region, in the vast northwest section of the country, constitutes nearly half of Brazil's territory, but the region is extremely underdeveloped and sparsely populated, with only about 7% of the nation's population. Within the region, named for the world's second longest river, are located the largest tropical rain forests in the world, as well as most of Brazil's indigenous peoples, which constitute about 1% of the country's population. Because of these characteristics, world attention has focused on deforestation and indigenous rights in this region.

These issues first gained international prominence in December 1988 with the murder of Chico Mendes, the leader of Brazil's rubber-tappers' union. Domestic attention had been drawn to the issues during the debate over the 1988 constitution which gave indigenous peoples rights to their traditional lands. International criticism subsequently focused on large-scale highway development projects; on the slash-and-burn farming techniques of cattle ranchers, loggers, and small scale farmers; on the release of deadly mercury into streams by gold prospectors (*garimpeiros*); and on weak state governments and lack of prosecution of those committing crimes against indigenous peoples.

These activities have been seen as posing a serious threat to the very survival of indigenous peoples, with some groups claiming that up to 1500 Yanomami (15% of the Yanomami population of 9,000 - 10,000) had died in 1988-1990. The destruction of the tropical rainforest was also seen as particularly damaging because of the loss of biological diversity (including the likely loss of important medicinal products) and the suspected contribution of the burning of forests to clear land to warming trends.

Reacting to national and international concerns, President Jose Sarney (1985-1990) announced a major plan, called "Our Nature," in April 1989 that suspended government subsidies to cattle ranchers in the Amazon, created the Brazilian Institute for Environment and Renewable Natural Resources (IBAMA), and authorized several new parks and reserves.

President Fernando Collor (1990-1992), expressing a strong commitment to environmental concerns, appointed an internationally acclaimed ecologist as Minister of the Environment, supported the dynamiting of illegal airstrips to reduce unauthorized gold prospecting, and launched a new environmental program called "Operation Amazonia." International criticism persisted, however, focusing on the plight of the stone age Yanomami Indians who were being killed by pollution and disease introduced by the goldminers. Brazil's National Indian Foundation (FUNAI) was criticized for failing to protect and support the country's indigenous communities.

In November 1991, President Collor authorized the demarcation of the Yanomami's territory, and despite local opposition, the demarcation was completed in early 1992.

Demarcation of the Menkragnoti territory for the Kayapo Indians was begun in 1992 as well. In June 1992, Brazil hosted the U.N. Conference on the Environment and Development (UNCED), where two conventions were opened for signature -- the Convention on Biological Diversity, and the Convention on Climate -- which advanced international consensus on environmental policies and biological and cultural diversity. Brazil took a strong environmental position and obtained international support for a number of long projects.

However, environmental efforts and demarcation of indigenous lands have lagged to some extent, partly because of the political uncertainties resulting from the impeachment of President Collor, and the indecision of Itamar Franco who succeeded him as president. The State Department's Human Rights Report for 1993 points out that the government had demarcated and issued titles for only half of the 519 indigenous areas which were to be designated, according to the 1988 Constitution. The government admits that goldminers remain in areas reserved for indigenous peoples, and incidents of lawlessness seem to be commonplace.

NOTE: There have been no convictions in any case involving the murder of Indians, including the murder of 10 Yanomami since 1987, the 16 Yanomami in August 1993, the murder of Guaraní leader Marçal Tupá-y in 1983, and the murder of two Atikum Indian leaders in 1991. The Catholic Church's Indigenist Council reported in mid-December that 42 Indians had been killed in 1993.

Physical and Human Dimensions of Deforestation in Amazonia

In the Brazilian Amazon, regional trends are influenced by large-scale external forces but mediated by local conditions

D. L. Skole, W. H. Chomentowski, W. A. Salas, and A. D. Nobre

Tropical deforestation is an important component of global change; it has a large influence on hydrology, climate, and global biogeochemical cycles (Crutzen and Andreae 1990, Houghton 1991, Houghton and Skole 1990, Salati and Vose 1984, Shukla et al. 1990). The Brazilian Amazon region is the largest intact tropical forest in the world. Brazil has the highest deforestation rate in the world, according to some estimates; deforestation rates may be 1.5×10^6 to 2.0×10^6 ha/yr (FAO 1993, Myers 1991, Skole and Tucker 1993).

Understanding of tropical deforestation, an important aspect of global change, is inadequate for two reasons: a lack of accurate measurements of its rate, geographic extent, and spatial pattern and a lack of insight into its causes (Skole in press). It seems obvious that tropical deforestation is the consequence of a variety of interrelated social, economic, and environmental factors. Yet, interpretations of how these factors interact to stimulate deforestation vary widely. Some interpretations focus chiefly on population growth, whereas others re-

The problem of land-cover change is complex and cuts across many scales of analysis

gard institutions as the main determinant (Allen and Barnes 1985, Browder 1988, Bunker 1984b, Meyer and Turner 1992, Moran et al. in press, Rudel 1989, Sanderson in press).

In this article, we propose an interdisciplinary approach for analyzing tropical deforestation in the Brazilian Amazon. We review both the physical and human dimensions of Amazonian deforestation and discuss some issues of measurement and analysis facing both physical and social sciences. We emphasize the need to analyze this problem across different scales of space and time, including local dynamics at the level of individual farms, regional patterns, and international conditions that influence Amazonian deforestation.

In the first part of this article, we take an empirical view, showing how deforestation can be measured and how satellite remote sensing can play an important role. Sociodemographic and economic data from standard census sources can supplement remote-sensing data to provide additional information. From this data-intensive set of observations and measurements, we pro-

pose an explanatory model in the second part. Here, we consider the relationship among deforestation and large-scale social, economic, and institutional factors. This discussion, leading from measurements to analysis, forms the basis for a research design presented in the last section. We center our discussion on the period from the late 1970s to the late 1980s, a period of most rapid change.

Physical dimensions of deforestation in the Amazon

To measure deforestation in the Brazilian Amazon, satellite remote sensing provides the best source of information. Landsat, Spot, and other sensors can be used to develop detailed maps of the rate and geographical extent of deforestation in tropical forests and thus to document the location and expansion of deforestation over time. It is also possible to use satellite data from the NOAA series of weather satellites to locate areas of intense deforestation. However, data from these sensors are too coarse to quantify precisely the areas or rates (Skole et al. in press).

Regional-scale patterns using remote sensing. We have mapped the area of deforestation in 1988 and the rate of deforestation between 1978 and 1988 for the Brazilian Amazon (Skole and Tucker 1993). We began with 210 Landsat Thematic Mapper images for the entire Legal Amazon of Brazil for 1988. Individual scenes

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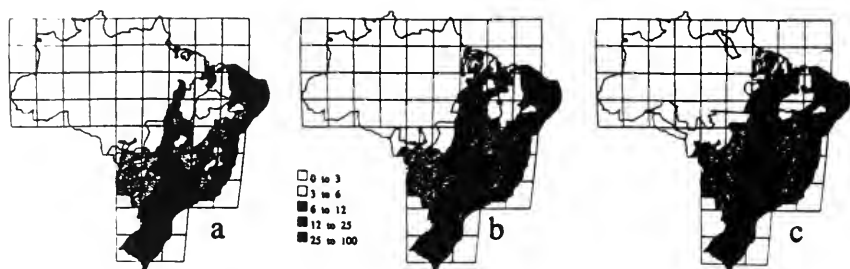


Figure 1. Land-cover conversion in Brazil in (a) 1970, (b) 1975, and (c) 1980 was estimated using land census data. The map shows the density of natural land cover converted to agriculture, expressed as a percentage of the area. When incorporated spatially in a geographic information system, these data depict the spread of agriculture and hence deforestation into the Amazon. Also shown is the high density of agriculture in the south of Brazil.

were digitized using visual interpretation and standard vector geographic information system (GIS) techniques. The exact boundary between intact forest and deforested land was digitized in the universal transverse mercator projection at 1:500,000 scale. All areas of closed canopy forest that had been deforested by 1988 were delineated, including areas of secondary growth on abandoned fields and pastures when visible. Individual digitized scenes were projected into geographic coordinates (latitude and longitude), edge-matched, and merged in the computer to form a single, seamless dataset for the entire Legal Amazon. This dataset was then projected into a sinusoid equal-area projection to create the final digital map from which all calculations of area were made.

This analysis provides rates of deforestation lower than previously estimated. By comparison to 1978 (Tardin et al. 1980), we estimate the rate of deforestation to be 15×10^3 to 20×10^3 km²/yr, which is considerably lower than estimates made without remote sensing data (Myers 1991) or from trend extrapolations (Fearnside 1982). Our estimates are in close agreement with those reported by the Brazilian Instituto de Pesquisas Espaciais (INPE 1992).

A digital map (page 317) was derived from satellite data of the average annual rate of deforestation in the Legal Amazon between 1978 and 1988. For simplicity of display at a small map scale, the data have

been aggregated into 16 x 16-kilometer grid cells. Spatially explicit maps such as these can provide insights into large-scale geographic patterns and trends in deforestation in the Amazon basin of Brazil on decadal time scales. Most deforested land is concentrated in a crescent along the southern and eastern fringe of the Amazon. We estimate the total area deforested in 1988 to be 230,324 km². This estimate suggests that 6% of the closed forests have been cleared to date over the entire Legal Amazon. This fraction is somewhat higher in certain states. In Maranhão, for instance, as much as 27% of the forest cover has been converted. Forest clearing in this part of eastern Amazonia has been occurring since the earliest settlements in the last century. However, 11.5% of the forests of Rondonia have been cleared, where there was little deforestation before the mid-1970s.

Regional-scale patterns from land census data. It is possible to obtain deforestation estimates using tabular summaries from standard government census sources. In the example below, data for each of the 3973 town-level political districts in Brazil are obtained from the Brazilian Census of Agriculture (IBGE 1970b, 1980). These data do not directly report the area deforested, but instead they provide estimates of land in various forms of permanent and temporary agriculture, including pastures. Because the major

cause of deforestation in the Amazon is agricultural expansion (Moran et al. page 329 this issue), these data can be used as a proxy for deforestation, but they cannot provide a direct measure of deforestation as with remote sensing. One value of agricultural census reports is that they provide data not available from remote sensing, such as crop type, farm size, fertilizer use, and other information related to land use, management, and tenure.

Land census data can be mapped using a geographic information system. A digitized map of the political borders of each district (*município*) in Brazil was constructed from base maps ranging in scale from 1:1,000,000 to 1:2,000,000. Each polygon represents a political district and is the basic geographic unit for which the land-use data were tabulated. The area of various land-use categories was assigned to each polygon, resulting in maps showing the geographic distribution of land-cover conversion (Figure 1). Because all data has been digitally encoded, they provide a spatial and temporal database for quantitative analysis of regional patterns. These maps show at three different times the areas that had been converted to agriculture expressed as fractions of the total area. The geographic pattern is similar to that derived from satellite data (map page 317).

Before 1970, most of the conversion had occurred in southern Brazil and along its coast. Different areas experienced conversion after 1970.

By comparing maps, one can see that most of the changes in land cover between 1970 and 1980 occurred along two major fronts. One is a north-south corridor along the Belem-to-Brasilia Highway. The other area extends west from the state of Mato Grosso into the colonization areas in the state of Rondonia.

Inspection of the GIS-based dataset indicates that significant movement of deforestation into the Legal Amazon began between 1975 and 1980. In 1970, only 14.6% of all agricultural land in Brazil (including pasture) was in the Legal Amazon. By 1980, this fraction increased to 22.3%. Between 1970 and 1975, 45% of the new conversions occurred in the Legal Amazon. Between 1975 and 1980, 56% of the new conversion occurred within the Legal Amazon, reflecting the beginnings of the trend toward expansion of agriculture and economic development in the region. A comparison of census-derived and satellite-derived estimates of the total area deforested is shown in Figure 2. The estimates are comparable, and they suggest an important role for census data to extend the historical record to periods before remote-sensing data were available.

Local-scale dynamics. Region-wide patterns of deforestation are the result of many local activities. Net deforestation is the sum of several gross land-cover transitions: primary forest conversion, abandonment of agricultural land (which imitates secondary succession), and re-clearing of successional vegetation. These fine spatial and temporal scale dynamics are important because the pattern and timing of clearing and abandonment affect biogeochemistry and other physical processes.

We have described typical local-scale patterns of deforestation in the state of Rondonia, where many of the new Amazon settlements have been developed. The patterns are derived from an analysis of high-resolution satellite data (Spot multispectral data with pixel size of 400 m²) in a 642 x 103 ha study area for the years 1986, 1988, and 1989 (Skole 1992).

We classified the data into three

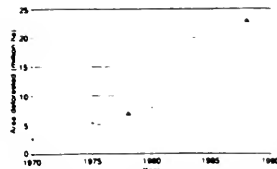


Figure 2. The total area deforested in the Legal Amazon closed-forest region, as estimated from agricultural census records (x) and satellite data (▲) combined to create a historical series.

land-cover classes: intact forest, active agriculture from new deforestation, and second-growth vegetation following abandonment; these three classes of land cover are distinguished by the relative reflectance in the near-infrared and visible bands (Figure 3). Moran et al. (page 329 this issue) describe a similar pattern of spectral discrimination. Extensive field verification of the classification took place in 1988, 1989, 1991, and 1993. This analysis thus provides a measure of the separate transitions between land-cover classes. Most analyses reported to date consider only forest and deforested areas, with the deforested area as the combined area of active agriculture and secondary growth. In addition, because the satellite data can be spatially registered, we have tabulated transition sequences for each 400-square-meter parcel of land or individual field.

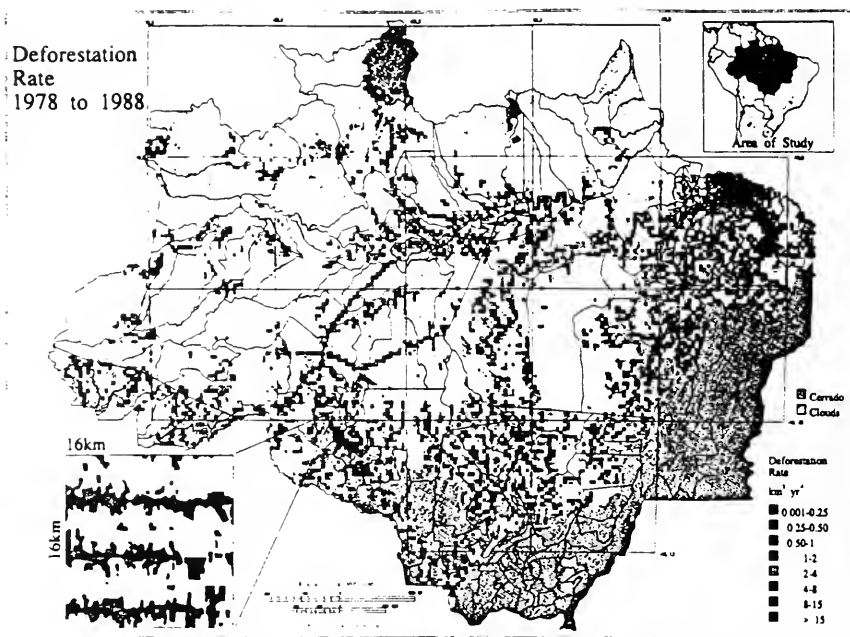
Figure 4 shows land-cover transitions that occurred in the study area between 1986 and 1988 and between 1988 and 1989. The values are annual transition rates for each period. Between 1986 and 1988, new agricultural land came from clearing 4.12×10^4 ha/yr of primary forest and 1.97×10^4 ha/yr of secondary vegetation. Between 1988 and 1989, 8.63×10^4 ha/yr of primary forest and 6.21×10^4 ha/yr of secondary vegetation were cleared for agriculture. Clearing of secondary vegetation is an important source of new agricultural land: between 1988 and 1989, 42% of the new agricultural land was created from clearing of secondary growth. The amount of agricultural land that remained as active agriculture from

one year to the next was 10.06×10^4 ha/yr between 1986 and 1988 and 25.04×10^4 ha/yr between 1988 and 1989.

The area in secondary succession is significant. Of the total land deforested (active agriculture plus secondary growth), approximately 33% was secondary vegetation in 1989, an increase over the 25% measured in 1986. The large and increasing proportion was also shown in sites in the eastern Amazon by Moran et al. (page 329 this issue). These satellite observations agree with long-standing field observations, but heretofore there have been no quantitative measurements. Our ongoing analysis of the entire Legal Amazon using satellite data suggests that secondary vegetation is widespread throughout the region. The implications for carbon storage are important, because regrowing vegetation accumulates carbon previously lost to the atmosphere from clearing.

The turnover of secondary vegetation (i.e., abandonment and re-clearing) is an important process. In this study area, the area abandoned each year was 70% of the primary forest area cleared between 1986 and 1988, and 83% of that cleared between 1988 and 1989. Approximately 11% of the active agricultural area was abandoned each year between 1986 and 1988. However, between 1988 and 1989, when there was more than a twofold increase in forest clearing, 22% of the agricultural land was abandoned annually.

If one-fifth of the agricultural land is abandoned each year, we estimate an average steady-state turnover time of approximately five years. This figure is generally consistent with what other observers have reported (Buschbacher 1986, Buschbacher et al. 1988, Uhl et al. 1988); land fertility and productivity decline to the point that the farmer abandons the land after approximately five years. Because satellite observations make it possible to separately track each 400-square-meter piece of land, it is possible to determine that out of the 5.804×10^4 ha that were abandoned to secondary growth between 1986 and 1988, 45% was re-cleared during the next year.



Deforestation in the closed-forest zone of the Brazilian Amazon Basin in 1988 was estimated from Landsat Thematic Mapper data. The map shows the total area deforested as of 1988. The original data were analyzed and digitized in a geographic information system at 1:250,000 scale as shown in the inset at lower left. For display purposes, the data have been summed into grid cells of 16 x 16 km and represented as a rate.

This analysis suggests the important and apparently inseparable coupling between land in active agriculture and secondary growth. The mode of production in this area is predicated upon maintaining both classes of land use. Moreover, abandonment rates tend to increase when increases in primary forest clearing produce net increases in secondary succession area. Thus, local ecological conditions, methods of agroecosystem resource management, and local decision making are as much a driving factor in deforestation as are demographic factors.

Human dimensions of deforestation in the Amazon

Site-specific observations provide an objective and quantitative approach

to the measurement of deforestation. When mapped over large regions such as the Amazon Basin, it is possible to see geographical patterns. By analyzing the geometry, size, and spatial arrangement of clearings, satellite imagery can also be used to categorize different types of deforestation (e.g., large pastures, small farms, extraction activity, and mining). But these observations alone cannot completely identify why deforestation occurs or determine what factors influence regional trends or local dynamics. Economic and institutional factors caused the explosive rates of deforestation in Amazonia beginning in the middle of the 1970s.

Demographic factors. In recent years, there has been a focus on the

relationship between population and land-use change. For example, Allen and Barnes (1985) surveyed population and deforestation data for 76 tropical countries using statistical correlation. They also examined multiple regressions of deforestation against other variables such as arable land, roundwood production, and gross domestic product. Their analysis suggested a low, but significant, correlation between population growth rates in the period 1970 to 1978 and deforestation reported for the period 1975 to 1980 from the FAO Forest Assessment (Lanly 1982). They concluded that population growth was the cause of deforestation globally.

In the Brazilian Amazon, Reis and Margulis (1990) have examined several anthropogenic causes for large

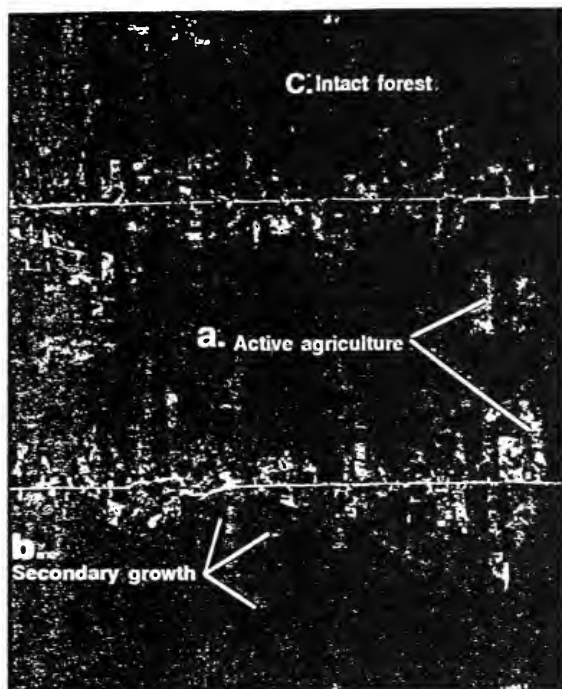


Figure 3. A subset of the satellite data used to analyze deforestation and secondary-growth turnover dynamics is displayed. Darker red areas (c) are intact forest, blue and green areas are active agriculture (a), and bright pink areas show secondary growth (b). The image is approximately 10 x 10 km. The scene center was placed at S 9° 31' 03" (degrees, minutes, seconds) and longitude W 63° 25' 28" and was acquired on 10 July 1988.

and increasing deforestation rates during the mid-1980s, ultimately relating these rates to emissions of carbon dioxide. One conclusion they draw is that population growth relates to deforestation when population density is plotted against deforestation density (fraction of an administrative district deforested). A multiple regression model, relating deforestation to several anthropogenic variables including the density of population, yielded a high correlation coefficient ($r = 0.81$). Kummer (1992) notes, however, that Reis and Margulis assume in their analysis that areas in question were 100% under forest cover at the be-

ginning of their study period. This assumption, which is not always correct, has the effect of attributing all deforestation to a single time period.

Regression analysis on deforestation rates derived from satellite data and population density for each of the several hundred municipal units in the Amazon for the period 1975 to 1978 revealed virtually no correlation at this scale (Skole 1994). The relationship reported by Allen and Barnes (1985) at the global scale is questionable when examined in smaller units.

Simple relationships to population growth may not alone describe

factors driving deforestation in the Amazon. In a study of cattle ranching in the Amazon, Hecht (Hecht 1985, Hecht 1993), concluded that government policy, fiscal incentives, and the nature of individual farmer decisions in an inflationary economy (i.e., owning cattle is a good hedge against certain economic conditions) are more significant determinants of deforestation than are demographic considerations. A similar view has come out of recent studies of declining wood stocks in sub-Saharan Africa (Anderson 1986, Anderson and Fishwick 1984) and Southeast Asia (Kummer 1992). In these case studies, population growth is viewed as one variable in a multiple feedback system rather than a forcing function.

Economic and institutional factors. Deforestation in the Brazilian Amazon, particularly in the eastern part, has been occurring for a long time. However, our estimates of total deforested area derived from satellite and statistical records indicate that 90% of the deforested area in 1988 was created after 1970. We hypothesize that events and conditions at national and international scales influenced the explosive rates of deforestation during this initial period of Amazonian frontier development. Changes in the structure of the national and international economy and the emphasis of national development policies during this period have been the dominant influence on Amazonian deforestation.

The most important agent of deforestation in the Amazon was agricultural expansion, particularly for pasture. If one examines the geographical pattern of agricultural expansion in Brazil during the 1970s, some interesting patterns emerge. Although the south of Brazil continued to have the highest density of agriculture in the late 1970s, its areal extent changed little. Agriculture quickly expanded into the Brazilian Amazon, where some states experienced the most dramatic changes anywhere in the country.

The state of Rondonia had nearly exponential deforestation rates during this period, as new colonization and settlement programs opened

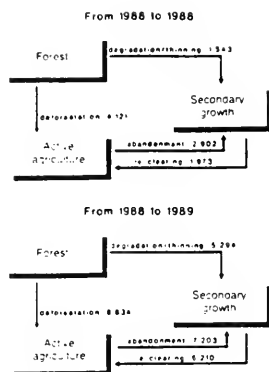


Figure 4. Transition rates between three land-cover classes. Values are hectares per year.

large tracts of forest. These settlement programs and specific fiscal incentives were established in the 1970s as a way to encourage migration from overpopulated, poverty-stricken, and drought-ridden regions in the south and northeast of the country (Hecht and Cockburn 1989, Mahar 1989, Moran 1981, Schmink and Wood 1984). The vast Amazonia was seen by many as an empty frontier, which at once could be consolidated under Brazilian national sovereignty and provide opportunity for millions of poor and landless people (Bunker 1984a,b). Long after the establishment of settlement programs, migrants continued to flow into the region (Lisansky 1990).

Deforestation in Amazonia is linked to changing demographic and economic conditions in the south of Brazil, particularly in the state of Parana. In the early 1970s, changes in land tenure and land use in Parana directly influenced deforestation in Rondonia. These changes resulted from international activities, particularly those related to world oil production, distribution, and price. Strong external factors created the preconditions for Amazonian deforestation that remained for a decade.

After the Organization of Petroleum Exporting Countries (OPEC) increased the price of oil in the mid-

1970s, large amounts of oil money (petrodollars) flooded international money markets (Pool and Stamos 1987). The price of oil went from \$1.30 per barrel in 1970 to \$10.72 per barrel in 1974 and to \$28.67 by 1980. Energy-dependent countries paid OPEC prices, resulting in a large net transfer of wealth from industrial economies to OPEC members. This revenue was then deposited in US and European banks in a process called petrodollar recycling (Pool and Stamos, 1987). Because banks must pay interest to depositors, these institutions were eager to find borrowers.

Developing countries such as Brazil required foreign capital to fund economic development, modernization, and industrialization programs. They also needed US dollars to pay for oil, because oil is bought and traded in dollars. Brazil's strategy appears to have been twofold: reduce the amount of imported oil by developing domestic sources such as hydroelectric energy, and borrow from foreign lenders to fund domestic economic development programs. Agricultural modernization was one focus of this development financing, because agricultural exports could be used to obtain foreign exchange and service the debt (Mahar 1989).

Agricultural modernization has been an important national goal in Brazil (Bunker 1984b, Mahar 1989, Moran 1981, World Bank 1982). In the last 20 years, total farmland area increased more than 60% and the land in crops increased 176% (IBGE 1970a,b, 1975, 1980, 1989). Between 1970 and 1980, there was

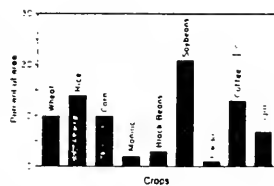


Figure 5. Allocation of crop credits in Brazil in 1978, shown as a percentage of the total area that received crop credits (World Bank 1982).

large-scale financial investment in agriculture. Crop credits increased almost fivefold (World Bank 1982). The use of machinery and other commercial inputs grew as Brazil became a leading agricultural exporter of such commodities as soybeans and oranges. Such investment programs were successful at least in part: rising crop credits occurred with increasing crop output, and the net value of agricultural output increased 2.68-fold between 1970 and 1980 (IBGE 1970a,b, 1975, 1980, 1989). By 1977, export crops made up more than 50% of the total value of principal crops.

The agricultural modernization programs resulted in changes in land allocation and land tenure. Figure 5 shows the distribution of crop credits by crop type in 1975. Three general patterns emerge. First, almost half of the total crop area receiving credits was used for three export crops: wheat, soybeans, and coffee. Second, the largest fraction of crop area was in soybean production. Third, little of the cropland received

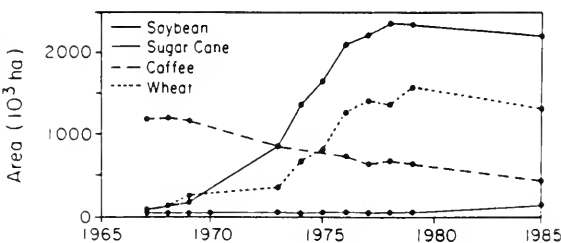


Figure 6. Area planted in major crops in the state of Parana between 1965 and 1985.

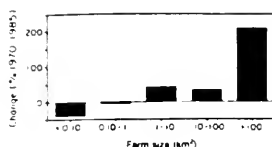


Figure 7. Change in farm-size distribution in the state of Paraná between 1970 and 1985. Units are the percentage increase or decrease in farms of each size class.

ing credits was used for staple crops such as black bean and manioc.

Soybean production was a major success story. The soybean area harvested increased sixfold in the 1970s, ten times more than any other crop except oranges and wheat. Soybean yields increased fivefold. The combination of land, fertilizers, improved seeds, and government-sponsored fiscal credits and incentives produced an internationally competitive export program.

Soybeans became one of Brazil's major export crops. Brazil provided 10% of the international soybean market in 1970, but half the global market by the early 1980s. Brazil had become the United States' chief competitor. Most of the soybean production was concentrated in two states, Paraná and Rio Grande do Sul. Figure 6 shows the trend in area planted in some important crops in

Paraná during this period. Soybean production (and wheat) replaced coffee as the major crop in the region. Government programs concentrated on replacing coffee fields with soybeans (World Bank 1982), because the international market for coffee, unlike soybeans, was highly variable and undependable.

One reason for Brazil's competitiveness in the soybean market might be related to comparative costs of production. Although costs of such inputs as fertilizers and pesticides are high in Brazil compared with other countries such as the United States, land costs are half that of the United States (World Bank 1982). As a result, overall costs are lower for Brazilian production than in the United States.

The modernization of agriculture came with structural changes in the economy. A labor-intensive, small-scale agricultural system was transformed into an important energy- and machinery-intensive component of the national economy, particularly in the state of Paraná. Land prices rose significantly (World Bank 1982) as land was consolidated into larger holdings. Coffee, a labor-intensive crop, was replaced by soybeans and wheat, whose cultivation uses machinery. This transformation of land use changed land tenure. Figure 7 shows the change in farm-size distribution in Paraná. There was a loss of small farms and

an increase in large, presumably commercial and mechanized, farms.

The period 1970-1980 saw increased migration from rural to urban areas. Part of this migration was in response to increased opportunities and wages in urban areas. At the same time, commercialization and mechanization of agriculture in Paraná displaced laborers. Migration out of the state of Paraná during this period was higher than that out of any other state (Figure 8).

In addition to the many migrants to urban areas, a large number went to the Rondonia frontier (Hecht and Cockburn 1989). On the frontier, new migrants cleared forests, planted crops, and opened new pastures, confronting the Amazonian ecosystems as best they could. At the level of the town or farm, local dynamics of land use and land management are determined by coping strategies. For instance, Hecht (1993) argues that clearing for pasture by farmers (the most important land use resulting from deforestation) is a rational individual economic strategy and an efficient way to capture value from the land.

In the last few years, many of the government programs that promoted deforestation have been drastically curtailed. As these programs were restructured and debt tightened the availability of money, the rate of deforestation has declined. The latest estimates of deforestation in the Amazon suggest that the rate is now half of what it was in the late 1980s (INPE 1992, Skole and Tucker 1993).

An interdisciplinary approach

The problem of land-cover change is complex and cuts across many scales of analysis. In the case of deforestation in the Brazilian Amazon, regional trends are influenced by large-scale external forces but mediated by local-scale conditions. A three-level, interdisciplinary approach to the study of deforestation in Brazilian Amazonia could be taken.

The overall approach would start with direct measurements of the rate, location, spatial pattern, and temporal characteristics of deforestation. Satellite remote sensing is a

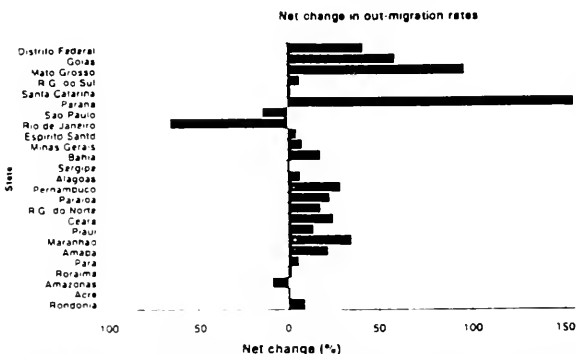


Figure 8. Net changes in out-migration rate for each state in Brazil between 1970 and 1980. Units are percentage change between 1970 and 1980. The state with the highest change in rate of out-migration was Paraná.

promising tool for objectively making these measurements at different spatial and temporal scales, from large-scale assessments of regional trends to local-scale analysis of complex dynamics. Although regional-scale satellite data alone might form the basis for empirical models with limited predictive capability (e.g., spatial trend or diffusion modeling), mapping of deforestation at scales of 1:100,000 to 1:500,000 with remotely sensed data would establish the regional context for integration with sociodemographic data from agricultural and demographic census documents. Such integration would provide useful information on land use, tenure, and management.

At a second level of analysis, case studies and field investigations could be carried out in conjunction with multitemporal, high-resolution satellite data at 1:50,000 to 1:100,000 scale to gain insight into local-scale dynamics of deforestation, abandonment, and second-growth turnover. These case-study analyses would use survey research and statistical data from census documents to define the parameters that control local land-use strategies, which would in turn illustrate how changes in land use affects changes in land cover. Complementary to this view is the work of Moran et al. (page 329 this issue) and of Hecht (1993). Both describe the important role local conditions play in determining land use and individual economic strategies.

Because the causes of deforestation may also significantly relate to external institutional and economic factors, an elucidation of driving forces cannot be made with satellite data and field studies alone. In Brazil, the factors responsible for deforestation in the Amazon originated far outside the region. They involved land-tenure changes in the south of Brazil and changes in the rapidly developing national economy, to some extent catalyzed by excess petrodollars and international lending. The substitution of machinery for labor, which was an important component of national agricultural modernization efforts, affected the forests of the Amazon. Migration to the Amazon was partly a response

to conditions and processes far removed from Rondonia and not solely the product of Brazilian population growth. Thus, deforestation is a more complex problem than simply there being too many people.

Political, institutional, and economic forces establish and modulate long-term conditions. Thus, it would be necessary at a third level of analysis to define the large-scale external factors and conditions that influence deforestation in the Amazon. The causes of Amazonian deforestation could then be considered in an international context.

Acknowledgments

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Call from AIBS Nominating Committee

Vacancies occurring in January 1996 for

President-Elect, Board of Directors, and Council

The AIBS Nominating Committee requests your assistance to identify active and interested biologists who can provide leadership to AIBS in the years ahead. From your suggestions, the Nominating Committee will prepare a slate of nominees to present to the Board of Directors at its February 1995 meeting. Elections will be held in spring 1995, and the successful candidates will take office in January 1996.

In addition to the President-Elect opening, there will be four vacancies on the Board of Directors. The President-Elect and two Board members will be elected by the general membership. The remaining two Board members will be elected by the Council. Nominations to fill three members-at-large to the Council also are being sought. Under AIBS bylaws, nominees must be individual members of the Institute.

A further provision of the AIBS bylaws states that within 90 days after the Council meeting in November 1994, additional nominations for any or all vacancies may be made by any twenty-five (25) individual members of the Institute. Such nominations shall be filed with the Executive Director, together with a signed statement of consent from each nominee.

Many biologists have found their past service in AIBS rewarding and exciting, the future promises far greater challenges. These offices require individuals willing to invest considerable time and effort toward promoting and unifying the biology profession.

Suggestions for nominees should be sent to the Executive Director, AIBS, 730 11th Street, NW, Washington, DC 20001-4521, no later than 1 November 1994.

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American Society of Plant Physiologists. *James E. Tavares*
American Society of Plant Taxonomists. *Robert B. Faden*
American Society of Zoologists. *Judith S. Weiss*
Animal Behavior Society. *Carlos Ruiz-Miranda*
Association for Tropical Biology. *Larry L. Rockwood*
Association of Ecosystem Research Centers. *Robert Van Hook*
Association of Southeastern Biologists. *Geraldine W. Twitty*
Association of Systematic Collections. *Amy Y. Rossman*
Biological Sciences Curriculum Study. *Jack L. Carter*
BIOSIS. *John Anderson*
Botanical Society of America. *Laurence E. Skog*
Council of Biology Editors. *Maria L. Lebrun*
Ecological Society of America. *Gary W. Barrett*
Entomological Society of America. *F. Chris Thompson*
International Society for Ecological Economics. *Robert Costanza*
Mycological Society of America. *Jerome Moffa*
National Museum of Natural History. *Frank H. Talbot*
The Nature Conservancy. *George Fenwick*
Organization for Tropical Studies. *Donald E. Stone*
Organization of Biological Field Stations. *Stephen P. Havers*
Phi Sigma Biological Sciences Honor Society. *Elizabeth Harris*
Physiological Society of America. *Larry B. Liddle*
Poultry Science Association. *Paul B. Siegel*
Society for Conservation Biology. *Stanley A. Temple*
Society for Industrial Microbiology. *George A. Somkuti*
Society for Mathematical Biology. *Torcom Chorbajian*
Society of Environmental Toxicology and Chemistry. *C. Herb Ward*
Society of Neurobiologists. *Lynn R. Krusberg*
Society of Systematic Biologists. *Roy W. McDiarmid*
Torrey Botanical Society. *Dominick V. Basile*
US Federation for Culture Collections. *Robert L. Ghera*
Weed Science Society of America. *James V. Parochetti*

PREPARED STATEMENT OF WILLIAM BALÉE, ETHNOBOTANIST, DEPARTMENT OF
ANTHROPOLOGY, TULANE UNIVERSITY

Thank you Chairman Torricelli for holding this important hearing on indigenous peoples and the natural environment of Brazil.

TRANSPARENCY 1

Pre-Amazonian is the extreme eastern part of the Amazon forest. It is about 6,500 square miles in extent today (larger than Connecticut, smaller than New Jersey), but was larger in the past.

The indigenous peoples of pre-Amazonia include the Ka'apor, Tembé, Guajá, and Kren-Ye Timbira, whose ancestors have been inhabitants of the region since prior to this century.

The flora of pre-Amazonian consists of at least 1,000 species of vascular plants, the great majority being trees.

The Ka'apor, Guajá, the Tembé peoples use about 90 percent of the plant species of the pre-Amazonian region. In addition, a certain portion of the forest has been altered in its species composition by horticultural indigenous peoples, such as ancestors of the Ka'apor, over perhaps hundreds of years.

TRANSPARENCY 2

In eight 1-hectare inventories of forest, of which 4 hectares were high (or primary forest) and 4 were anthropogenic forest called fallow. I found that the fallow, which was created by the Indians, accumulates species diversity at a rate similar to that of high forest. This represents an indigenous contribution to regional biodiversity, insofar as some of the species would not exist were it not for indigenous agroforestry practices of the past and present.

TRANSPARENCY 3

An extraordinary contrast is to be found today in pre-Amazonia. Where there are no Indians, there is also no forest left, as this satellite image from July 1990 of the eastern boundary of the Upper Turiaçu Indian Reserve plainly shows. Today, much of the southern portion of the reserve would show up as deforested pink because of illegal invasions by ranchers, squatters, and loggers.

What stands to be lost with the current illegal deforestation of pre-Amazonia?

I perceive at least five major losses:

1. Loss of life;
2. Indigenous knowledge of the uses of the plant species will soon vanish; some of this knowledge could have universal, sustainable applications, in new food crops, medicines, textiles, and fuels. Without the forest, indigenous knowledge of pre-Amazonian plants, as well as indigenous culture itself, which is inextricably tied to the existence of the forest, would certainly perish;
3. The imminent, total destruction of pre-Amazonia forest would cause plant and animal species endemic to the region to go extinct; it would cause nonendemic species, moreover, to go locally extinct;
4. Because it is the last substantially intact, as well as, legally protected area east of the Tocantins River, the destruction of pre-Amazonia will eliminate the most important potential seed bank for any future reforestation projects in the region of the Belém refuge (states of Pará and Maranhão), given also that its biological (species of flora and fauna) and environmental conditions (such as soils and rainfall) are similar to the rest of the Belém refuge;
5. Finally, the different but highly successful and environmentally enhancing modes of land use—indigenous agroforestry in eastern Amazonia and foraging (or hunting and gathering) stand to be forever destroyed by the illegal invasion and destruction of what remains of pre-Amazonia.

These outcomes are not inevitable, but increasingly probable, unless vigorous pressure is exerted on the Federal Government in Brasília so that it comply with its own Constitution and lend protection to the indigenous peoples and their forests in pre-Amazonia.



